

**ORDER**

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ARTS IIA INTERIM SUPPORT PLAN PROJECT IMPLEMENTATION PLAN



December 18, 1992

**DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION**

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## FOREWORD

This order transmits the project implementation plan (PIP) for the automated radar terminal system (ARTS) IIA Interim Support Plan (ISP) contract number DTFA01-90-C-00057. It provides management direction and technical guidance from the project inception through commissioning for orderly implementation of the ARTS IIA ISP project. The procedures and responsibilities identified herein follow the Federal Aviation Administration's (FAA) directives currently in force. This order establishes program management and program implementation procedures; defines responsibilities governing the activities of organizations; and identifies and describes specific events and activities to be accomplished in order to implement the ARTS IIA ISP project in accordance with FAA-STD-036. The ARTS IIA ISP project implements Capital Investment Plan (CIP) projects 32-06 and 46-30.



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## CHAPTER 1. GENERAL

1. PURPOSE. This order transmits the update to the automated radar terminal system (ARTS) IIA project implementation plan (PIP) which provides management direction and technical guidance in the implementation of the ARTS IIA segment of the Interim Support Plan (ISP) project to all levels of the Federal Aviation Administration (FAA) from project inception through commissioning. The order provides overall guidance and direction to participating organizations by establishing program management and project implementation procedures, and by defining organizational roles and responsibilities in support of project implementation. In addition to providing overall guidance and direction for implementation, this order identifies and describes specific events and activities to be accomplished.

2. DISTRIBUTION. This order is distributed to the branch level in the offices of the Program Director for Automation; Program Manager for Advanced Automation, Air Traffic System Management, NAS Systems Engineering Service, NAS Transition and Implementation Service, Operational Support Service, Systems Maintenance Service, Facility System Engineering Service, Air Traffic Rules and Procedures Service, Associate Administrator for Contracting and Quality Assurance, and Air Traffic Plans and Requirements Service; to the branch level of the regional Airway Facilities and Air Traffic divisions; and to Air Traffic and Airway Facilities field offices with ARTS IIA automation systems.

3. DEFINITIONS.

a. Terms.

(1) A2.XX level of ARTS IIA operation software currently used in the field.

(2) Paramax Systems Corporation - contractor's name.

b. Acronyms.

AACU	Aural Alarm Control Unit
AAP	Advanced Automation Program
AAS	Advanced Automation System
AC	Alternating Current
AF	Airway Facilities
APC	Acquisition Processing Cabinet
APME	Associate Program Manager for Engineering
APML	Associate Program Manager for Logistics
APMQ	Associate Program Manager for Quality
APMT	Associate Program Manager for Testing

ARTS	Automated Radar Terminal System
ASR	Airport Surveillance Radar
AT	Air Traffic
ATC	Air Traffic Control
ATCBI	Air Traffic Control Beacon Interrogator
BBU	Battery Back-up Unit
BEXP	Bar Expander
BK	Back
BOC	Baseline Offset Corrector
BRD	Board
BRITE	Bright Radar Indicator Tower Equipment
BT	Beacon Tracking
CA	Conflict Alert
CAI	Contractor Acceptance Inspection
CCA	Circuit Card Assembly
CCB	Configuration Control Board
CCD	Configuration Control Decision
CIP	Capital Investment Plan
CM	Configuration Management
CO	Contracting Officer
COAX	Coaxial Cable
COTR	Contracting Officer's Technical Representative
COTS	Commercial off-the-shelf
CPFS	Computer Program Functional Specification
CPU	Central Processing Unit
CSQCPP	Computer Software Quality Control Program Plan
CTRL	Control
DADCP	Data Acquisition Device Controller Processor
DBRITE	Digital BRITE
DDAS	Decoding Data Acquisition Subsystem
DDCP	Display Device Controller Processor
DE	Data Extraction
DECCO	Defense Commercial Communications Office
DEFRT	Defruiter
DISP	Display
DOT	Department of Transportation
DPS	Data Processing Subsystem
DR&A	Data Reduction and Analysis
DRR	Deployment Readiness Review
DS/DP	Dual Sensor/Dual Processor
DSS	Disk Storage Subsystem
DT&E	Development Test and Evaluation
E&R	Exchange and Repair
EP	Enhancement Processor
EXCOM	Executive Committee



F&E	Facilities and Equipment
FAA	Federal Aviation Administration
FAT	Factory Acceptance Test
FCA	Functional Configuration Audit
FD	Floppy Drive
FLT	Flight
GFE	Government Furnished Equipment
HCM	Hardware Configuration Management
HDR	Hardware Discrepancy Report
I/O	Input/Output
ICD	Interface Control Document
IFDC	Interfacility Device Controller
ILS	Integrated Logistics Support
ILSP	ILS Plan
INCO	Installation and Cutover
INTFC	Interface
INTR	Interrupt
IOC	Initial Operational Capability
ISP	Interim Support Plan
ISSAC	Initial Supply Support Allowance Chart
JAI	Joint Acceptance and Inspection
KBD	Keyboard
KDC	Keyboard Device Controller
KVa	Kilo-Volts amperes
LRU	Line Replaceable Units
LSI 2/40	Brand Name for Central Processor Unit
MALA	Mode S/ASR-9 Line Adapter
MB	Megabytes
MBI	Maxi-Bus Interface
MCI	Mode C Intruder
MIPS	Million Instructions Per Second
MMU	Memory Management Unit
MSAW	Minimum Safe Altitude Warning
Msec	Microseconds
MSU	Mass Storage Unit
MTDC	Magnetic Tape Device Controller
MTP	Master Test Plan
MTU	Magnetic Tape Unit
MVME 167	Motorola Single Board Computer
NAILS	National Airspace Integrated Logistics Support
NAILSMT	NAILS Management Team

NAS	National Airspace System
NCP	NAS Change Proposal
OPM	Office of Personnel Management
ORD	Operational Readiness Demonstration
OS	Operating System
OST	Office of the Secretary of Transportation
OT&E	Operational Test and Evaluation
PAT&E	Production Acceptance Test and Evaluation
PCA	Physical Configuration Audit
PDSR	Program Director Status Review
PEM	Position Entry Module
PIP	Project Implementation Plan
PM	Program Manager
PMP	Program Master Plan
PS	Power Source
PTR	Program Trouble Report
PWR	Power
QA	Quality Assurance
QCSP	Quality Control System Plan
QRO	Quality Assurance Reliability Officer
RADS	Radar Automated Display Subsystem
RIG	Regional Integration Group
REF	Reference
SCIP	Surveillance Communication Interface Processor
SCM	Software Configuration Management
SCSI	Small Computer System Interface
SDC	System Development Corporation
SE	Systems Engineering
SETA	Systems Engineering and Technical Assistance
SMC	System Monitor Console
SOST	System Onsite Test
SW	Software
T&E	Test and Evaluation
TBS	To be supplied
TELCO	Telephone Company-Telecommunications Interface Group
TIG	Terminal Integration Group
TIM	Technical Interchange Meeting
TO	Technical Officer
TOR	Technical Onsite Representative
TPRC	Test Policy Review Committee
TRACAB	Terminal Radar Approach Control in Tower Cab
TRACON	Terminal Radar Approach Control
TSG	Training Scenario Generator

TTG	Training Target Generator
TTY	Teletypewriter
UDS	Universal Data Set
UPS	Uninterruptable Power Source
Vac	Volts alternating current
VBI	VMEbus Interface
VC	Video Compression
VDC	Volts Direct Current
VME	Brand Name of Chassis

4. AUTHORITY TO CHANGE THIS ORDER. This order is issued under the authority of the Director, NAS Transition and Implementation Service, ANS-1; the Program Director for Automation, ANA-1; the Director, Air Traffic Plans and Requirements Service, ATR-1; and the Director, Office of Air Traffic Systems Management, ATM-1. The authority to issue changes to this order is reserved for the Program Manager for Terminal Automation ARTS II, ANA-400.

5. APPLICABILITY. The information contained herein will be used by FAA offices, services, regions, centers (Mike Monroney Aeronautical Center (AMC) and FAA Technical Center), terminal sites, and contractor personnel for accomplishing their support of the ARTS IIA ISP hardware and operational software implementation activities. The guidance and schedule information contained herein will form the framework for these organizations in the more detailed planning activities required at the regional and field levels. Deviations from this order must be approved by the Program Manager for Terminal Automation ARTS II, ANA-400.

6. DURATION. The duration of this program will continue through the last ARTS IIA ISP equipment delivery and acceptance.

7.-19. RESERVED.



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## CHAPTER 2. PROJECT OVERVIEW

20. SYNOPSIS.

a. General. The ARTS IIA ISP is part of the Capital Investment Plan (CIP) projects 46-30 and 32-06. CIP project 22-06 is a related project. As stated in CIP 46-30, the ARTS IIA ISP sets forth solutions to maintain the capacity and capability for ARTS IIA equipped airports in the near term until implementation of the advanced automation system (AAS). The objective is to meet the Air Traffic Control (ATC) requirements within an acceptable timeframe and provide the assurance of component standardization and interchangeability to minimize maintenance and repair costs. The ARTS IIA ISP equipment manufacturing contractor is Paramax Systems Corporation, previously called Unisys. The ARTS IIA ISP acquisitions will be acquired via a sole source contract DTFA01-90-C-00057 signed on September 30, 1990.

b. System Deployment. There are 20 ARTS IIA ISP systems to be installed, 12 of the systems are Government Furnished Equipment (GFE) and were procured under a previous contract. Each system has four radar automated display subsystems (RADS), which are not included in the overall RADS procurement. There are four ARTS IIA systems in the basic contract award (see appendix 1 for locations), eight in option #2, and eight in option #6. All sites will be subject to a deployment readiness review (DRR) conducted by the Airway Facilities Planning Branch (AAF-11), in conjunction with, Engineering Terminal Automation ARTS II Program (ANA-140). Paramax Systems Corporation will be responsible for the shipment of equipment to each site and manpower necessary to provide proper installation. The Technical Onsite Representative (TOR) is responsible for oversight of the installation of the systems to ensure compliance with FAA policies and procedures.

c. RADS and Hardware Deployment. The ISP basic contract establishes 158 RADS at 95 ARTS IIA field sites. There will be 52 RADS, with 30 aural alarm control units (AACU) for operational positions; 78 RADS established as training positions; and 28 RADS used for support. RADS and related equipment will be installed in accordance with FAA policies and procedures by FAA personnel except for those associated with contractor installed systems. Option #5 has 50 RADS and 25 AACU's that will be deployed to ARTS IIA sites. Option #1 will replace the teletypewriter (TTY) and magnetic tape unit (MTU) with system monitor console (SMC) and disk storage subsystem (DSS) respectively. Option #1 also includes the enhancement processor (EP) functional upgrade. Option #4 includes the dual sensor/dual processor (DS/DP) and

Mode C Intruder (MCI) upgrades which require a video compression (VC) board in the RADS. The sites and delivery schedule are listed in appendix 1.

d. Software Deployment. Option #1 will port the ARTS IIA A2.06 kernal to the EP by using C language and provide the functionality to interface to the DSS and SMC. The SMC software will provide a 386/ix operating system (OS) that offers multitasking capabilities and allows access to the large amounts of memory needed to accommodate data reduction and analysis (DR&A), and training scenario generator (TSG). Through X-windows the screen and window management facilities are provided, allowing continuous display of all messages from the ARTS IIA while another task is operating in the foreground. The DOS-under-UNIX extension, VP/ix, will allow MS-DOS applications to run in the UNIX environment. Option #4 will provide the MCI function and increase the capacity of the ARTS IIA from 102 tracks to 256 tracks. In option #4 the high level language used will be Ada and some specific functions in C. Option #4 will also provide new functions for on-line file manager, automatic failure recovery, and the intersensor link for the DS/DP configuration.

21. PURPOSE. The improvement of ATC terminal systems is a fundamental objective of this order. The ARTS IIA ISP contract satisfies objectives of the CIP for selected low and medium activity airports in the near term by adding up to 20 systems, 208 RADS, replacement of the MTU and TTY, and other obsolete parts. The ARTS IIA ISP will provide those items necessary to continue safe operation until implementation of the AAS.

22. HISTORY.

a. Operational Requirements. The ARTS IIA segment of the ISP provides a response to operational requirements of the terminal system improvement plan. The objectives are to maintain a very high level of safety, impose minimum constraints with efficient use of the system, and minimize operations costs. The ARTS IIA was planned for low to medium activity terminal radar facilities. As growth in air traffic continues, more facilities will have operational needs that exceed the ARTS IIA system design capacity. Requirements that exceed ARTS IIA capacity are flight plan storage, display capacity, and multisensor capability. ARTS IIA facilities with A2.06 software have not received additional displays, with the exception of those undergoing conversions from terminal radar approach control (TRACON) in tower cabs (TRACAB) to TRACON needed to handle the increased capacity. In addition to these operational requirements, ARTS IIA system reliability, maintainability, and

availability have become more critical as air traffic levels at many ARTS IIA facilities approach or surpass those of ARTS IIIA. System availability is adversely impacted by power losses and surges; lack of MTU and teletype subsystems backup capability; and mechanical device wearout.

b. Contractual History. In 1974, the FAA awarded the initial ARTS II contract to Burroughs Corporation to equip 70 airports with ARTS II systems. In March 1982, a hardware/software development contract was awarded to System Development Corporation (SDC), a Burroughs Company, to develop the capabilities of Beacon Tracking (BT), Conflict Alert (CA), Minimum Safe Altitude Warning (MSAW), Training Scenario Generator and Training Target Generator (TSG and TTG), Data Extraction (DE) and DR&A. The contract modified the existing ARTS II software and added a faster processor, additional memory, a memory power supply, a memory management unit (microprocessing device controller), and an aural alarm subsystem. In July 1985, a production and implementation contract was awarded to SDC, later called Unisys, that has resulted in more than 125 ARTS IIA's being fielded. In July 1989, a request for proposal was submitted to Unisys (now Paramax Systems Corporation) for a sole source procurement to provide additional equipment to sustain the ARTS IIA's until the AAS is implemented. This procurement was awarded in the second quarter of fiscal year 1991. It will provide additional hardware and software necessary to sustain the ARTS IIA's.

23.-29. RESERVED.



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## CHAPTER 3. PROJECT DESCRIPTION

30. FUNCTIONAL DESCRIPTION. The existing ARTS IIA functional baseline presented in figure 3-1 has a single-cabinet configuration. The configuration employs an large-scale integration (LSI) 2/40 central processor unit (CPU) with teletype console, magnetic tape storage, and interfaces to the local RADS/digital bright radar indicator tower equipment (DBRITE) display/keyboards and aural alarms. The ARTS IIA interfaces to beacon and radar inputs and interfacility data communication link.

a. The ISP upgrade provides for deployment of two hardware/software upgrade kit options. Each kit option provides improved features to be installed at existing ARTS IIA sites. The ARTS IIA ISP upgrades to the ARTS IIA baseline discussed in subsequent sections are:

(1) First Phase, ISP option 1:

(a) MTU and TTY replacement.

(b) Design and implementation of enhanced processor.

(2) Second Phase, ISP options 3 and 4:

(a) Automatic failure recovery.

(b) DS/DP option.

(c) Software to implement the MCI functionality.

(d) Video compression.

b. The ARTS IIA ISP upgrade project replaces the existing TTY and MTU with the SMC and high performance DSS. Figure 3-2 depicts a functional overview block diagram of the ARTS IIA ISP upgrade. This hardware configuration allows the system to function in either the current or upgraded version depending on the software installed in the computer. The facility will have the capability to revert back to the existing hardware and operational software by a reload if the need arises. This fall-back configuration will be available until the FAA or facility removes the MTU and TTY.

FIGURE 3-1. ARTS IIA FUNCTIONAL OVERVIEW DIAGRAM

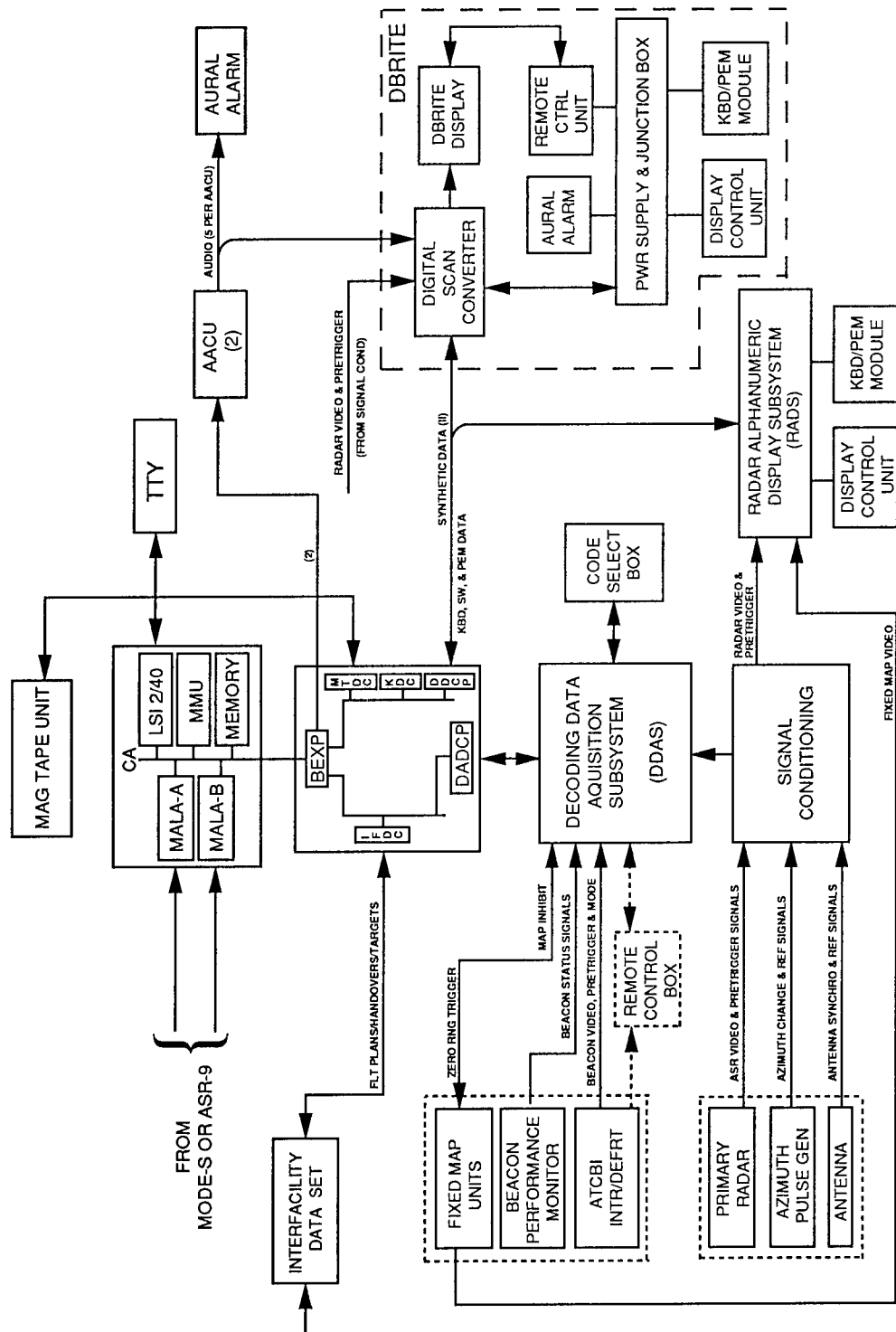
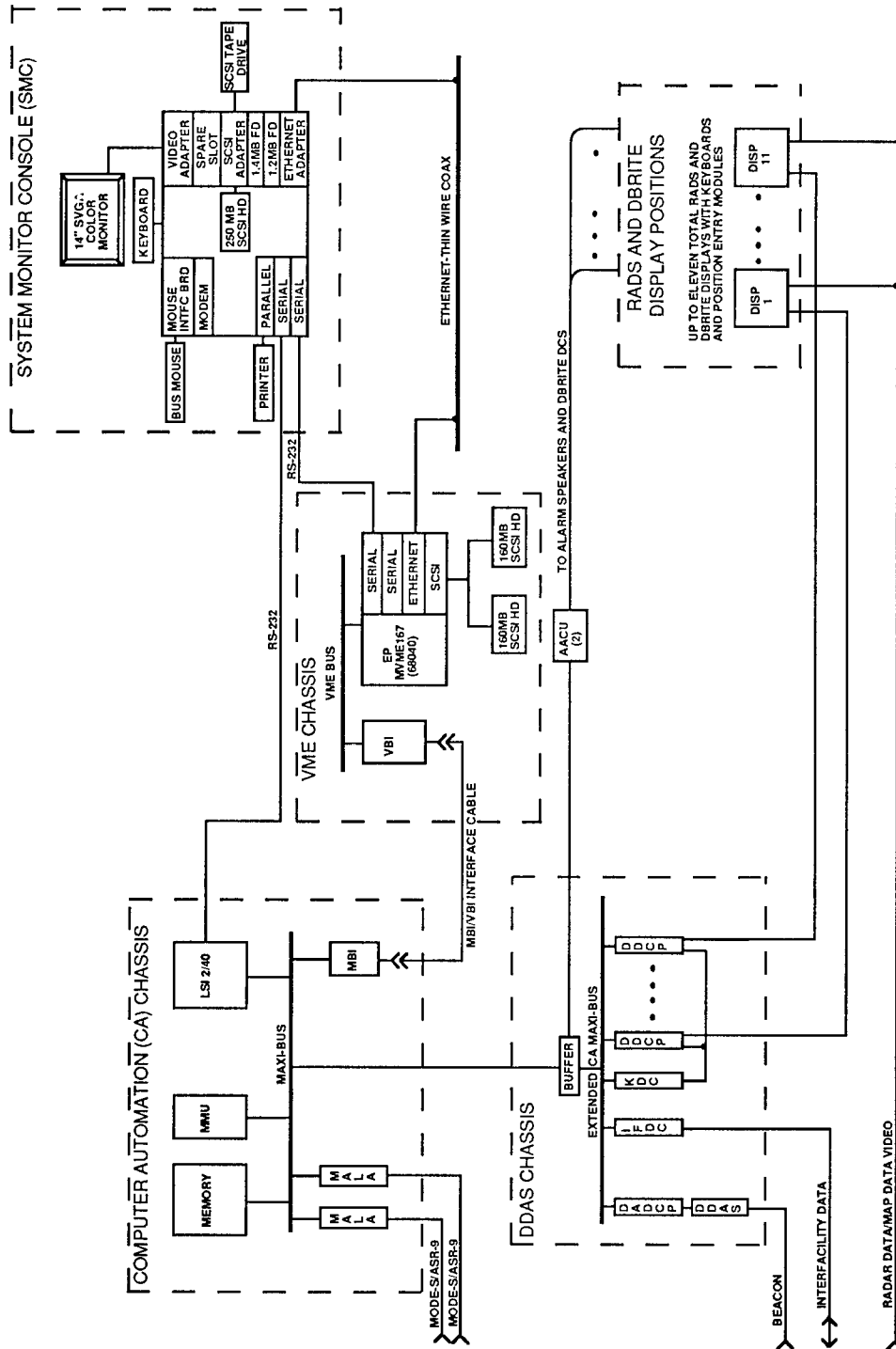


FIGURE 3-2. ARTS IIA ISP FUNCTIONAL OVERVIEW DIAGRAM



c. In the acquisition processing cabinet (APC), a small computer system interface (SCSI) circuit card has been added to the LSI 2/40 chassis for controlling the new DSS 160 MB drives. These assemblies are mounted in a VME chassis where the MTU is currently located. Also, the interface to the SMC is through the same SCSI bus, via the SCSI interface board to the SMC. The SCSI interface links the SMC to the LSI 2/40, DSS mass storage units (MSU), and simplifies integration of new upgrades. The Mode S/ASR-9 Line Adapter (MALA) board is designed to interface ASR-9 and ARTS IIA ISP. The MALA boards are installed in existing slots in the chassis of the LSI 2/40.

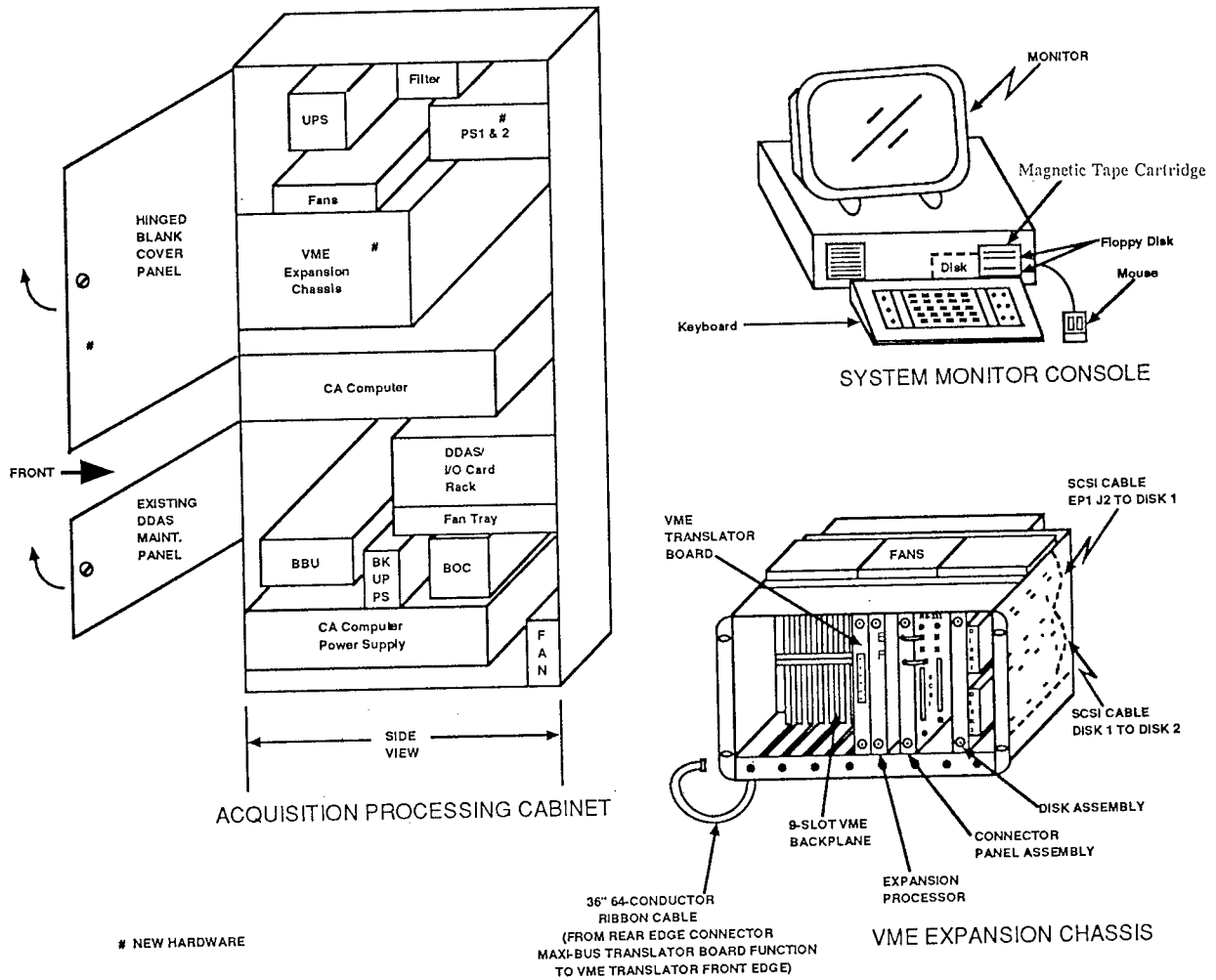
d. The SMC has additional processing power to accommodate data reduction and analysis, TSG, flight plan editing, site adaptation modification, and failure recovery functions. The SMC provides data base management, archiving, and loading facilities for itself and the LSI 2/40. The SMC OS on the SMC supports X-Windows. The multi-tasking X-Window environment provides "task-windows" for each operator control task, allowing the operator to easily monitor and control concurrent processes in both the SMC and LSI 2/40.

e. The ARTS IIA Version A2.06 operational software will provide both new and changed functionality. The new functions consist of the on-line file manager, automatic failure recovery, and the intersensor link for the DS/DP configuration. Other functions will be modified to access the EP for dual cabinet communication and file input/output (I/O) tasks. The LSI 2/40 will communicate with the EP via a custom I/O interface. The EP performs as a file server, managing all disk I/O on the MSU, and as a communications server, performing as an Ethernet node for the ARTS IIA cabinet.

31. PHYSICAL DESCRIPTION. The ISP basic system hardware upgrade kit consists of five elements: the free-standing SMC and SMC printer plus three modules installed in the existing ARTS IIA Acquisition Processing Cabinet (APC). The three APC hardware upgrades provide the following:

a. The VME expansion chassis contains the EP, the MSU, a Maxi/VME interface circuit card assembly (CCA) linking the LSI 2/40 to the VME bus, and a VME power supply whose input is supplied by an uninterruptable alternating current (AC) power supply. The 19 inch rack-mount VME chassis is used to house two hard disks, the EP, the interface panel assembly and the CA-VME interface translator board. The VME bus chassis has 21 slots on 0.8 inch centers and mounts in the space vacated by the MTU (see figure 3-3).

FIGURE 3-3. ARTS IIA ISP HARDWARE CONFIGURATION



Each MSU consists of two independently addressable disk drives each of which has self parking heads with the following characteristics:

- (1) Capacity: 160 Mbyte, formatted.
- (2) Data Transfer Rate: 1.5 Mbytes/sec minimum.
- (3) Track-to-track access: 4 msec (max).
- (4) Track Access: 28 msec (avg max).

b. The complementary Maxi/VME interface board links the LSI 2/40 to the VME bus and is installed in the LSI 2/40 chassis. The Maxi/VME interface consists of a Maxi-bus translator CCA, a VME-bus translator CCA and a multiconductor interconnecting cable.

c. A replacement APC I/O and decoding data acquisition subsystem (DDAS) power module replaces the existing obsolescent model, provides more power margin for increased reliability, and provides a power factor correction module. The VME power unit provides +5 volts direct current (Vdc), +12 Vdc, and -12 Vdc for the disk drives and VME CCA's. This power unit has the required surge capacity for starting the drive motors. A separate power on/off switch is provided so the DSS may be powered down independent of the rest of the data processing subsystem (DPS). This power unit is mounted on the power supply shelf located at the rear of the APC.

32. SYSTEM REQUIREMENTS. The power usage and heat dissipation requirements for the ARTS IIA ISP are similar to that of ARTS IIA. Table 3-1 provides the electrical and air conditioning requirements associated with the ARTS IIA. Table 3-2 provides maximum equipment separation distances. It is anticipated that ARTS IIA ISP will decrease power consumption. The equipment selection has not been made to provide data at this time.

33. INTERFACES. At ASR-9 and Mode S sites, the radar interface is through the surveillance communications interface processor (SCIP). At a Mode S only site, the interface to the beacon radar is through a set of synchronous modems. The major ARTS IIA external interfaces are provided in table 3-3 (these are the same for ARTS IIA ISP).

Interface requirements are defined in the following Interface Control Documents (ICD):

a. Mode S to ASR-7/ARTS-IIA Terminal Sites  
(TM-PA-0018/0072/00-2),

b. Mode S to ASR-8/ARTS-IIA Terminal Sites  
(TM-PA-0018/0072/00-1),

c. ASR-9 SCIP to Terminal Computer (Westinghouse Data Item SE007-4).

34.-39. RESERVED.

TABLE 3-1. ELECTRICAL/HVAC REQUIREMENTS FOR MAJOR EQUIPMENT

<u>FAA Unit</u>	<u>FAA Designation</u>	<u>Power Data (120 Vac)</u>		<u>Dissipation (BTU/hour)</u>
		<u>Amps.</u>	<u>KVa</u>	
Acquisition and Processing Cabinet	FA-9021	14.0	1.7	5500
Code Select Box	FA-9023	0.2	0.07	75
Display Control Panel	FA-9024	#	#	#
Remote Control Box	FA-9022	##	##	##
RADS	FA-9030	9.1	1.1	3520
Keyboard and PEM	FA-9032	##		#
TTY	Teletype Corp. Model 4330	0.5	0.06	225
Aural Alarm	FAA-10148A	0.2	0.02	75
Control Unit and Speaker	FAA-10148B	--	-	--
1 RADS (SN 600 and above)	FA-9030	6	0.72	2304
1 APC with DSS/SMC Kit	FA-9021	11.8	1.41	4555
1 System Monitor Console (SMC)	TBS (10/30/93)			
1 SMC Printer	TBS (10/30/93)			
1 SMC Monitor	TBS (10/30/93)			

#Included in RADS

##Included in Code Select Box



TABLE 3-2. MAXIMUM EQUIPMENT SEPARATION DISTANCES

<u>Equipment</u>	<u>Separation</u>
Radar (non ASR-9/Mode S) to APC	Up to 12,000 feet
SCIP (ASR-9/Mode S) to APC	Up to 4,000 feet
APC to SMC (System Monitor Console)	Up to 50 feet
APC to RADS	Up to 500 feet
APC to DBRITE (Digital Scan Converter)	Up to 500 feet
AACU to Speaker	Up to 500 feet

TABLE 3-3. MAJOR ARTS IIA ISP INTERFACEEquipment

ATC beacon

Airport surveillance radar (ASR)

Defruiter

Radar microwave link (RML)

Beacon performance monitor

Video mapper

DBRITE

Interfacility modems

Surveillance communication interface  
processor

## CHAPTER 4. PROJECT SCHEDULE AND STATUS

40. PROJECT SCHEDULES AND GENERAL STATUS. The project major milestones activity schedule is provided as appendix 1. Appendix 1 depicts the project activities with major milestones to be implemented via contract DTFA01-90-C-00057. Updates to this appendix will be provided periodically by ANA-140.

41. MILESTONE SCHEDULE SUMMARY. Current installation schedules for ARTS IIA ISP sites can be obtained from the associate program manager for engineering (APME). The schedules are updated periodically by the APME and made accessible to the sites or regions by contacting the CIP Coordinator at each region. The first installation will occur at the FAA Technical Center in support of integration and shakedown testing. Concurrently, ISP kits will be delivered and installed at other non-operational sites to support training as needed (FAA Academy and FAA Logistics Center). At the completion of testing at FAA Technical Center, a system will be installed at an operational field key site for further testing. After successful key site testing, delivery to operational sites will begin. More than one key site may be selected to fulfill project needs.

42. INTERDEPENDENCIES AND SEQUENCE. The ARTS IIA new site requirements were established by the Mode S and ASR-9 programs (reference CIP 24-12 and 24-13 programs).

43.-49. RESERVED.



## CHAPTER 5. PROJECT MANAGEMENT

50. PROJECT MANAGEMENT, GENERAL. Management of the ARTS IIA ISP project is the responsibility of the program manager (PM) for Terminal Automation Program ARTS II, ANA-400. The PM will accomplish management tasks within the guidelines provided by FAA policies, procedures, and directives. The PM ensures that the contractor has access to technical documentation, appropriate data bases, and sources of information relative to GFE. The APME supports the PM in managing terminal automation programs. A technical officer (TO) within ANA-140, will provide technical guidance and direction to the contractor within the scope of the contract. Also, a contracting officer (CO) from Automation/Advanced Automation Branch (ASU-350), is assigned to perform general contract management activities to assure that the terms of performance under the contract are met. The CO is the only person authorized to make changes affecting prices, deliverables, or schedules. Management and technical support to the project manager and TO are provided by the Advanced Automation Program Systems Engineering and Technical Assistance (AAP SETA) contractor.

51. PROJECT CONTACTS. Appendix 3 provides a telephone list of project management personnel designated as contacts for their respective organizations.

52. PROJECT COORDINATION. The following paragraphs list organizational elements requiring ARTS IIA ISP coordination and their respective responsibilities in support of the project.

a. FAA Headquarters. The following organizations within FAA Headquarters, Washington, DC will fulfill the indicated project responsibilities:

(1) NAS Transition and Implementation Service, Special Programs Integration Division (ANS-300).

(a) Formulate and manage the ISP facilities and equipment (F&E) budget.

(b) Prepare and maintain the ISP Program Master Plan (PMP) and other documentation required to describe and manage the activities of the ISP.

(c) Serve as spokesperson for the ISP, and control and approve dissemination of program information according to Department of Transportation (DOT)/FAA regulations.

(d) Represent the FAA in dealings with the Office of the Secretary of Transportation (OST), other Government agencies, contractors, and the Congress on matters regarding the ISP.

(e) Coordinate all ISP activities and all related documentation.

(f) Chair all ISP conferences and working groups and assure adequate coordination with participants.

(g) Provide regular reports of the ISP status relative to established cost, schedule, and budget baseline.

(h) Develop and implement program controls and tracking systems to support the management process.

(i) Provide liaison across organizational boundaries when necessary to facilitate implementation of the ISP.

(2) Automation Engineering Division (ANA-100).

(a) Provide technical guidance and direction to the contractor in the design, development, production testing, installation, and integration of the hardware and software and ensure that all technical contract requirements are met.

(b) Establish and chair project working groups as required.

(c) Serve as chairperson of the ANA Configuration Control Board (CCB).

(d) Serve as a member of the Air Traffic (AT) CCB.

(e) Co-chair the National Airspace Integrated Logistics Support Management Team (NAILSMT) in conjunction with the associate program manager for logistics (APML).

(f) Serve as a member of the Test Policy and Planning Review Board (TPRC).

(g) Conduct the Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA).

(3) Terminal Automation ARTS II Program (ANA-400).

(a) Prepare the Master Test Plan (MTP) jointly with the Engineering, Test, and Evaluation Service (ACN).

(b) Provide guidance to all offices, services, centers, and regions on project implementation. This includes, but is not limited to:

1. Site installation.
  2. Disposition of excess equipment.
  3. Provisioning.
  4. Updates to the maintenance concept.
  5. Training.
  6. Configuration management (CM).
  7. Documentation deliverables.
  8. All phases of testing.
  9. Operational readiness demonstration
- (ORD).
10. Operations changeover.

(c) Manage project interdependencies with interfacing projects.

(d) Ensure the availability of funds and keep the contract within budget limitations.

(4) Systems Maintenance Service, Maintenance Engineering Division (ASM-100). Ensure execution of an effective provisioning program in conjunction with ASM and AMC organizations.

(a) Co-chair the NAILSMT.

(b) Verify that Integrated Logistics Support (ILS) activities conform to the contract requirements.

(c) Review development of logistic support data.

(5) National Automation Engineering Field Support Division (AOS-300). Duties of this organization are performed in tenant status at the FAA Technical Center. For a further description of responsibilities, refer to the AOS-300 listing under field organizations.

(6) Office of Air Traffic Systems Management, Civil Operations Division (ATM-100).

(a) Assist in the development of shakedown and operations changeover plans with ANA, regions, and the FAA Technical Center.

(b) Ensure that all operational aspects of system implementation are satisfactorily covered by the regions prior to operation changeover.

(c) Provide support on ATC functions, hardware configuration, and operational requirements which interface with associated terminal and/or en route automated systems.

(d) Update the operations and procedures handbooks, as may be necessary.

(e) Provide AT training requirements program, (ATZ-100) with any special training requirements.

(f) Serve as a member of the ANA CCB.

(g) Serve as a member of the AT CCB.

(h) Serve as a member of project working groups established by ANA.

(i) Support the DRR process.

(7) Air Traffic Rules and Procedures Service, Procedures Division (ATP-100).

(a) Assist in the development of shakedown and operations changeover plans with ANA, regions, and the FAA Technical Center.

(b) Ensure that all operational aspects of system implementation are satisfactorily covered by the regions prior to operation changeover.



(c) Provide support on ATC functions, hardware configuration, and operational requirements which interface with associated terminal and/or en route automated systems.

(d) Update the operations and procedures handbooks, as may be necessary.

(e) Provide the AT training requirements program, (ATZ-100) with any special training requirements.

(f) Serve as a member of the ANA CCB.

(g) Serve as a member of the AT CCB.

(h) Serve as a member of project working groups established by ANA.

(i) Support the DRR process.

(8) Air Traffic Plans and Requirements Service, System Plans and Programs Division (ATR-100).

(a) Develop plans, requirements, programs, and standards for system improvement, modification, and expansion of the ATC system, and maintain the AT system plan.

(b) Establish operational requirements for AT systems throughout the agency. This excludes the development of operating procedures and separation standards.

(c) Validate and develop requirements, in support of present and near term AT environment for:

1. Integrating the results of development efforts into the operating system.

2. Expanding and improving the current system.

(d) Develop specific capital investment priorities based upon AT system requirements for the Facilities and Equipment (F&E) budgetary processes for current and near-term planning scenarios.

(e) Identify and validate telecommunications requirements necessary for the accomplishment of AT activities, and coordinate with ASM to develop plans for implementing the required service.

(f) Serve as the AT spokesperson for coordination of present and near-term programs and system requirements with other offices, services, agencies, and organizations.

(g) Collaborate with the Automation Software and Planning Division, the Advanced Systems and Facilities Division, and the National Automation Field Support Division to ensure that the validated requirements are being satisfied during development, testing, and evaluation of new systems.

(h) Assess current programs and proposed planning requirements, based on agency planning standards and guidelines, and recommend priorities for system improvement, modification, and expansion and make adjustments as appropriate.

(i) Plan for a secure and effective AT system communications capability and develop AT communications requirements.

(j) Serve as the AT spokesperson for coordinating FAA policy and planning relative to privatization activities and aviation weather services provided by AT facilities.

(k) Determine operational requirements for appropriate real-time data interchange capability between en route, terminal and flight service elements of ATC automation systems.

(9) Air Traffic Plans and Requirements Service, Automation Software Policy and Planning Division (ATR-200).

(a) Analyze field data, staff studies, and system design concepts to develop recommendations to the Associate Administrator for Air Traffic for improvements in the on-line national ATC automation systems.

(b) Participate in the monitoring of computer program performance, design, production, and test and evaluation activities with the FAA Technical Center.

(c) Participate in reviews and make recommendations regarding the need for automation equipment for the ATC systems.

(d) Assess the timely implementation of ATC operational software changes required to support new operations and procedures.

(e) Collaborate with other organizations as necessary in determining the points at which ATC operational data systems and program data systems are interdependent or related and jointly established procedures which will ensure that these systems are planned and operated in a coordinated manner.

(f) Approve on behalf of the Director, Air Traffic Plans and Requirements Service, those computer software standards and procedures pertaining to the operational automation activities conducted by AT field elements.

(g) Serve as the focal point for software CM decisions.

(h) Participate in the review of software specification development for the purpose of ensuring that software development for the future ATC automation satisfies the operational requirements stated for the particular systems.

(i) Serve as chairperson of the AT CCB.

(10) Air Traffic Plans and Requirements Service, National Automation Field Support Division (AOS-400).

(a) Duties of this organization are performed in tenant status at the FAA Technical Center. For a further description of responsibilities, refer to the AOS-400 listing under field organizations.

(11) NAS Support Division (ASM-700).

(a) Integrate ARTS IIA ISP logistics efforts with the NAS program.

(b) Initiate and maintain effective supply support procedures.

(c) Initiate and execute an effective provisioning program.

(d) Provide policy and procedural guidance to regional Airway Facility (AF) divisions and AMC-1 for appropriate property controls prior to certification.

(e) Assist ANA in providing procedures for the disposal or utilization of surplus material.

(f) Serve as a member of project working groups established by ANA.

- (g) Serve as a member of the ANA CCB.
- (h) Serve as a member of the AT CCB.
- (i) Support the DRR process.
- (j) Provide support to test and evaluation parameters for incorporation in shakedown testing.
- (k) Serve as a member of the Test Policy Review Committee (TPRC).

(12) NAS System Engineering Service, Automation Division (ASE-100).

- (a) Serve as a member of the ANA CCB.
- (b) Serve as a member of the AT CCB.

(13) NAS System Engineering Service, Engineering Specialties Division (ASE-600).

- (a) Provide NAS system level requirements for test and evaluation.
- (b) Verify compliance with NAS system level and Operational Test and Evaluation (OT&E) requirements.
- (c) Coordinate test policy waivers.
- (d) Verify compliance with Order 1810.4B, FAA NAS Test and Evaluation Policy.
- (e) Provide guidance and direction on the conduct of FCA and PCA.

(14) Office of Training and Higher Education, Airway Facilities Training Program Division (AHT-400).

- (a) Develop and recommend technical training policies, programs, standards, systems, and procedures to meet FAA program requirements, applicable Federal laws, and Office of Personnel Management (OPM) and DOT regulations.
- (b) Administer technical training programs and policies.
- (c) Evaluate the technical training programs and ensure that measures are taken to correct deficiencies.

(d) Provide training programs.

(e) Develop, operate, and maintain a management information system.

(f) Support the DRR process.

(15) Office of Training and Higher Education, Air Traffic Training Program Division (AHT-500).

(a) Develop and recommend technical training policies, programs, standards, systems, and procedures to meet FAA program requirements, applicable Federal laws, and OPM and DOT regulations.

(b) Administer technical training programs and ensure that measures are taken to correct deficiencies.

(c) Evaluate the technical training programs and ensure that measures are taken to correct deficiencies.

(d) Provide training programs.

(e) Develop, operate, and maintain a management information system.

(16) Office of Air Traffic Program Management, Training Requirements Program (ATZ-100).

(a) Provide national technical training program guidance to the Office of Training and Higher Education through the submission of training proposals, review and approval of training plans, review of specifications and contractor developed proposals in response to request for proposal for training, and the development of training courses and materials.

(b) Develop national AF technical training and personnel certification policies, standards, and guidelines.

(c) Support AF field training requirements.

(17) Systems Maintenance Service, Maintenance Operations Division (ASM-200).

(a) Represent the service in the implementation and interpretation of laws, regulations, and department and agency policies affecting AF personnel.

(b) Provide national technical training program guidance to the Office of Training and Higher Education through the submission of training proposals, review and approval of training plans, review of specifications and contractor developed proposals in response to request for proposal for training, and the development of training courses and materials.

(c) Develop national AF technical training and personnel certification policies, standards, and guidelines.

(d) Support AF field training requirements.

(18) NAILS Implementation Branch (ANS-430).

(a) Assign an APML to support the PM in managing the total NAILS effort.

(b) Plan and coordinate the development of NAILS requirements.

(c) Evaluate and integrate NAILS requirements in the planning and procurement process.

(d) Coordinate the development and update of the Integrated Logistics Support Plan (ILSP).

(e) Monitor and track all NAILS functions.

(f) Review contractor NAILS data deliverables.

(g) Review all procurement documents for inclusion of NAILS requirements.

(h) Chair NAILSMT meetings in conjunction with the PM.

(19) Automation/Advance Automation Branch (ASU-420).

(a) Provide test support during the conduct of factory acceptance tests.

(b) Provide quality assurance (QA) support for production acceptance test and evaluation (PAT&E).

(c) Perform preliminary inspection and acceptance of items delivered to the FAA under the contract.

(d) Provide an Associate Program Manager for Quality (APMQ).

(e) Provide an onsite Quality Assurance and Reliability Officer (QRO).

(f) Provide support to T&E parameters for incorporation in shakedown testing.

(g) Support ASM for conduct of FCA/PCA as required.

(20) AAP SETA Contractor. The AAP SETA contractor is responsible for program support in the following areas:

(a) Assist in the preparation of procurement packages for the systems and subsystems.

(b) Assist in reviewing contractor technical proposals for the systems and subsystems.

(c) Monitor system and subsystem design and the status of system and subsystem technical activities.

(d) Provide technical assistance in the review and evaluation of system and subsystem designs, production and test; and perform analyses of technical problems as directed by the Contracting Officer's Technical Representatives (COTR).

(e) Plan, schedule, and monitor activities associated with field installation of systems and subsystems.

(f) Support the CM process.

(g) Provide technical assistance in the review and development of training policies, programs, standards, systems and procedures.

(h) Provide technical support in the execution of an effective provisioning program.

b. Field Organizations. The responsibilities of elements within the FAA Technical Center, regions and other field organizations follow:

(1) Engineering, Test, and Evaluation Service (ACN-100A). ACN-100A personnel are responsible for the support necessary to test and evaluate the software for functional and operational performance and for compliance with the contract requirements. ACN-100A personnel will perform these duties in accordance with Order 1810.4B, which designates ACN as the APMT.

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Accordingly, ACN will designate a test director for the project. ACN will also:

(a) Develop OT&E and NAS integration requirements for each subsystem (project) in coordination with AT, AF, other user organizations, and acquisition PM's.

(b) Prepare testing program directives and coordinate agreements with ATR/AND/AAF/ASU.

(c) Prepare test monitor guidelines; prepare test plans and test procedures for OT&E in accordance with FAA-STD-024a; prepare NAS integration test plans and procedures in accordance with FAA-STD-024a and prepare/concur on Development Test and Evaluation (DT&E) test plans and procedures.

(d) Direct the conduct of DT&E, NAS integration, PAT&E, and OT&E; conduct DT&E, NAS integration and OT&E data analysis; and prepare reports.

(e) Support ASE in development of NAS system-level requirements for T&E.

(f) Support acceptance testing at the first field site in accordance with PM program directive.

(g) Maintain the status of test progress and test problems.

(h) Present reviews to the PM, as required.

(i) Serve as a member of the ARTS IIA CCB, as required.

(j) Operate and maintain NAS subsystems delivered to the FAA Technical Center after FAA acceptance of the equipment.

(k) Provide for facilities readiness.

(l) Maintain project documentation in accordance with Order 1750.6, NAS Documentation Facility.

(m) Establish initial training requirements for FAA Technical Center personnel and coordinate with ATZ-100 and ASM-210.



(n) Establish financial and item management control and accountability for all agency property received at the FAA Technical Center.

(o) Support the DRR process.

(2) National Automation Engineering Field Support Division (AOS-300).

(a) Provide input to OT&E requirements.

(b) Support the DRR process.

(c) Serve as a member of the TPRC.

(d) Develop system shakedown requirements.

(e) Develop shakedown test plan and procedures in accordance with FAA-STD-024a.

(f) Conduct shakedown testing, perform data analysis, and prepare reports.

(g) Support shakedown testing at the first field site in accordance with the PM's program directive.

(h) Serve as a member of the ANA CCB.

(i) Serve as a member of the AT CCB.

(j) Review, approve and distribute maintenance/diagnostic contract deliverables for field use.

(k) Provide maintenance support for hardware, firmware, and diagnostic software.

(l) Coordinate transition and system certification at the sites.

(m) Serve as a member of project working groups established by ANA.

(n) Ensure execution of an effective provisioning program in conjunction with the ASM and AMC.

1. Co-chair NAILSMT.

2. Verify ILS activities conform to the contract requirements.

3. Review development of logistic support data.

(o) Provide configuration management of hardware/firmware.

(p) Support the FCA and PCA.

(3) Air Traffic Plans and Requirements Service, National Automation Field Support Division (AOS-400).

(a) Provide input to OT&E requirements.

(b) Serve as a member of the TPRC.

(c) Develop system shakedown test requirements.

(d) Develop shakedown test plans and procedures in accordance with FAA-STD-024a.

(e) Act as the primary organization for CM of ARTS IIA software.

(f) Conduct the transition to operational control.

(g) Maintain operational software programs once development is complete.

(h) Review, approve, and distribute for field use ARTS IIA ISP software contract deliverables.

(i) Serve as a member of the ANA CCB.

(j) Serve as a member of the AT CCB.

(k) Conduct shakedown testing, perform data analysis and prepare reports.

(l) Support shakedown testing at first field site in accordance with the PM's program directive.

(m) Support the DRR process.

(n) Support the FCA and PCA.

(4) Mike Monroney Aeronautical Center, FAA Logistics Center (AMC-1).

(a) Accomplish cataloging and provisioning of equipment.

(b) Provide supplies and working equipment for each facility receiving equipment.

(c) Provide national project material which is not procured by ASM.

(d) Support ASM for conduct of FCA/PCA as required.

(5) Mike Monroney Aeronautical Center, FAA Academy (AMC-1).

(a) Develop, monitor, and conduct training programs as directed by AHT-1.

(b) Adapt national engineering specifications to local conditions and perform engineering services within nationally provided guidelines for the installation, inspection, and acceptance of the system, including subsystem components at the FAA Academy.

(c) Perform preliminary acceptance of items delivered to the FAA Academy under the contract.

(d) Provide engineering feedback to ANA-140 for correction of system or equipment deficiencies for the installed systems.

(e) Provide for technical supervision of onsite activities performed under the contract at the AMC.

(f) Develop, in conjunction with ASU and ANA-140, logistics policies and plans for support of a system.

(g) Participate in planning activities for the transition of system equipment into the logistics inventory.

(h) Participate, as requested by AHT-1, in the review of instruction books.

(i) Assure timely selection of necessary instructors and maintenance personnel to meet AMC's' training and staffing requirements.

(6) Regions. Each region will appoint a regional associate program manager (RAPM) (see paragraph 51). The RAPM will ensure that required facility modifications are completed prior to the delivery of hardware and software. The RAPM will monitor installation and coordinate requests for contractual or technical support with ANA-140 and AOS-300. The RAPM will arrange for the appointment of a TOR at each facility. The regions will fulfill the following responsibilities:

(a) Prepare and monitor site installation in accordance with schedules provided in appendix 1. Coordinate with ANA and ATR on any changes to these schedules.

(b) Establish a regional integration group (RIG) to provide for coordination, direction, and guidance necessary for effective and timely implementation of the project. The RIG will be chaired by the RAPM and will be comprised of regionally selected AF and AT personnel knowledgeable in implementation of automation programs. The RIG will be responsive to the guidance and direction of the region PM for monitoring efforts at each site within the region. The RIG is to monitor and provide assistance and guidance in all phases of the terminal automation implementation for all regional sites.

(c) Designate a TOR to serve at each terminal facility. The TOR provides the regional coordination, direction, and guidance necessary for effective and timely accomplishment of site preparation functions during terminal automation implementation at their assigned site. This includes onsite decisionmaking and day-to-day problemsolving. The TOR is to be the principal onsite regional representative who reports problems, progress, and other matters to ANA-140 through appropriate regional representatives. The TOR is to be guided by approved test documentation and the PIP. Established channels of communications between regions and ANA-140 are to be used in carrying out the terminal automation program. The TOR is also to serve as a member of the RIG and terminal integration group (TIG).

(d) Assign a member within each site to the TIG. The TIG is to be comprised of designated onsite regional AT and AF personnel experienced in the implementation of electronic and/or automation systems. The TIG will be designated no later than 90 days prior to equipment/software delivery to the respective site. The TIG will be responsive to the TOR's guidance and direction. Personnel assigned to the TIG are to be engaged in test activities subsequent to initial operational capability (IOC).

(e) Assure that regional logistics requirements are provided to AMC-400 and ANS-430.

(f) Support the development of test plans and procedures for integration and shakedown testing.

(g) Coordinate efforts to conduct software integration and shakedown testing.

(h) Conduct and/or monitor site acceptance and field shakedown testing.

(i) Monitor and coordinate the ORD and commissioning.

(j) Support ACN during OT&E testing.

(k) Coordinate site shakedown and operations changeover testing in accordance with the requirements of the test plans for these functions.

(l) Assure environmental and "as built" records are developed.

(m) Assure all telecommunication acquisitions for ARTS IIA ISP telephone company (telco) service requires are obtained through the Defense Commercial Communications Office (DECCO) within prescribed time.

(n) Assure that appropriate FAA/local military onsite agreements are reached.

(o) Assure the facility prepares the local operations changeover plan.

(p) Coordinate commissioning exercise with the facility.

(q) Coordinate the development of site specific adaptation data with AT personnel.

(r) Establish financial and item management control, and accountability for all agency property received in the region.

c. Project Support Organizations.

(1) ARTS IIA Software Integration Team is an inter-branch/section software coordination group established to define and manage the interface software activities associated with integration of project software and for obtaining commitments from organizations. The team is the focal point for resolving inter-branch/section technical and management issues associated with software integration.

(a) Membership. The software integration team is comprised of representatives from the following organizations:

1. Program Director for Automation (ANA)  
Chairman.
2. Air Traffic Plans and Requirements  
Service (ATR).
3. Office of Air Traffic Systems Management  
(ATM).
4. Air Traffic Procedures Division  
(ATP-100).
5. Engineering, Test, and Evaluation Service  
(ACN).
6. Systems Maintenance Service (ASM).
7. AAP SETA contractor.

(b) Duties of Members. Responsibilities of designated members are as follows:

1. Act as the focal point of their respective organizations for software integration issues.
2. Provide liaison among the software integration team and their respective organizations.
3. Take necessary action within their respective organizations for software integration issues.
4. Keep their respective organizations informed of software integration issues/activities.

(2) CCB. In accordance with Order 1800.8F, National Airspace System Configuration Management, the CCB is the official agency authorized to approve or disapprove baselines and changes to baselines. There is a central NAS CCB to establish and control baselines and to administer configuration control. From this CCB, authority is delegated to lower-level CCB's to effectively administer proposed changes at the most appropriate level. All lower-level CCB's are accountable to the NAS CCB which has been established through a charter defining its authority, responsibilities (including the specific documents over which the CCB has control), and membership. Decisions and directives are documented in configuration control decisions (CCD), which either approve, disapprove, defer, or refer the change request to another CCB. When contractual action is required, the CCD serves as a basis for preparation of a procurement request which is submitted to the CO. The CCD may also be distributed to other Government agencies and serves as an official notification of CCB action. Representation on the CCB include the various agency services/offices that have responsibilities to acquire, support, and operate the system. Representatives of other organizations may be invited to attend as required.

(3) Two lower level CCB's have been established to oversee modifications to the ARTS IIA ISP. The ANA CCB was established to act on NAS Change Proposals (NCP) relating to the hardware and hardware specifications and standards. The ANA CCB will refer NCP action to either the National Airspace System (NAS) CCB or Systems Engineering (ASE) CCB if circumstances dictate. The AT CCB was established to act on NCP's relating to changes submitted on the operational software or the software computer program functional specifications (CPFS). They too have the authority to refer actions to either the NAS or ASE CCB as necessary.

(a) ANA CCB.

1. Chairperson: Manager, Automation Engineering Division (ANA).

2. Membership:

a. NAS Transition and Implementation Service (ANS).

b. Air Traffic Plans and Requirements Service (ATR).

c. Office of Air Traffic Systems Management (ATM).

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d. Air Traffic Rules and Procedures  
Service (ATP).

e. Systems Maintenance Service (ASM).

f. NAS System Engineering Service  
(ASE).

g. AAP SETA contractor.

h. Associate Administrator for  
Contracting and Quality Assurance (ASU).

(b) AT CCB.

1. Chairperson: Manager, Air Traffic  
Automation Software Division (ATR).

2. Membership:

a. NAS Transition and Implementation  
Service (ANS).

b. Office of Air Traffic Systems  
Management (ATM).

c. Air Traffic Procedures Division  
(ATP).

d. Program Director for Automation  
(ANA).

e. Systems Maintenance Service (ASM).

f. NAS Systems Engineering Service,  
(ASE).

g. Associate Administrator for  
Contracting and Quality Assurance (ASU).

h. AAP SETA contractor.

(3) DRR EXCOM Board. In accordance with Order 1810.4B, the executive committee (EXCOM) DRR board receives from the PM a DRR report containing operational and contractual requirements that have not been met, if any. The EXCOM DRR board is the official activity authorized to approve or disapprove implementation of the subsystem/system into the NAS.



Representatives on the EXCOM DRR board include the agency services/offices that are responsible for acquisition, support, and operation of the system. Other representatives may be invited to attend as required.

(a) Membership.

1. Air Traffic Plans and Requirements (ATR).
2. Office of Air Traffic Systems Management (ATM).
3. Program Director for Automation (ANA).
4. Systems Maintenance Service (ASM).
5. NAS Systems Engineering Service (ASE).
6. AAP SETA contractor.
7. Associate Administrator for Contracting and Quality Assurance (ASU).
8. Associate Administrator for NAS Development (AND).
9. Airway Facilities (AAF).
10. Facility System Engineering Service (AFE).
11. NAS Transition and Implementation Service (ANS).
12. Engineering, Test, and Evaluation Service (ACN).

53. PROJECT RESPONSIBILITY MATRIX. Table 5-1 identifies organizational offices having primary and supporting responsibility for major project activities.

TABLE 5-1.  
ACTIVITY RESPONSIBILITY MATRIX

<u>TASK/PLAN/ACTIVITY</u>	<u>PRIMARY OFFICE</u>	<u>SUPPORTING OFFICES</u>
Implementation Schedule	ANA-140 ATR-120	Regions
Training Programs Schedules and Assignments	ATZ ASM-260, AHT-400/500	ATR, ANA-140, ATP, ATM AAT, Regions, AMC, AOS-300
Configuration Management Hardware (H/W) Software (S/W) and Firmware (F/W)	ASE ASM ATR	ANA-140, AOS-400, ATP, ATM, ATR-200, Regions
Software Maintenance (Operational)	AOS	Regions, ATR-230, ANA-140, AOS-300, ATM
Software Maintenance (Diagnostic)	AOS	Regions, ATR-410, ANA-140
NAS Integration Test Plan and Procedures	ACN-220	ANA-140, ATR-200, AOS-400, AOS-300, ASE-100, ASE-600
Shakedown Test Plan	AOS-300	ANA-140, ATM, ATR Regions, ACN, ASE
Shakedown Test Procedures	AOS-300	ANA-140, ATP, ATR ATM, ACT, ASE, ASU
Operations Changeover Plan	Regions	AOS-300, ATR, ATP, ATM
Disposition of Excess Equipment Plan	ANA-140 ATR-120	AMC Regions
Logistic Support Planning	AMC	ANA-140, Regions
Operational Readiness Demonstration Test Plan/Procedures	Regions	ANA-400, ATP, ATM AOS-300, ASE
NAILS	ANS-430	AMC-1, AMA-1, AOS-300

54. PROJECT MANAGERIAL COMMUNICATIONS. Project managerial communications are provided monthly to ANA-1, AND-1, ANS-1, and AAF-1 through a program director status review (PDSR). The PDSR provides insight into any cost, schedule, technical, or logistic issues that may exist. Communications with the various branches of ANA, ANS, ATR, ATP, ATM, AMC, FAA Technical Center, and the regions occurs formally through technical interchange meetings (TIM) that are initiated during all stages of the program.

55. IMPLEMENTATION STAFFING. Staffing peculiar to implementation of the projects includes assignment of RAPM's, RIG's, TOR's, and TIG's. Their responsibilities are defined in subparagraph 52b.

56. PLANNING AND REPORTS.

a. Reports.

(1) The Configuration Control and Status Accounting Report provides the configuration identification and information to determine the status of change proposals, deviations, waivers, and implementation status.

(2) The Project Progress Report provides the TO with a monthly assessment of contractual efforts as of the date of the report. Included are work scheduled for the next period, any special problem areas and proposed solutions.

(3) The PDSR provides monthly information to FAA upper management on cost, schedule, and technical status of the projects.

(4) The PAT&E Test Report documents the actual results of PAT&E.

(5) The Hardware Discrepancy Report documents hardware discrepancies.

(6) The Operational Changeover Report documents the changeover activities to bring a site into the NAS.

(7) The Program Technical Report documents software discrepancies.

(8) The DRR Report documents the results of the deployment readiness process and provides recommendations to the EXCOM DRR.

(9) The Shakedown Test Report documents the results of ACN (FAA Technical Center) shakedown testing.

(10) The NAS Integration Report documents the results of NAS integration testing and is the responsibility of the ACN test director.

(11) The OT&E Test Report documents the results of OT&E.

b. Plans.

(1) The Shakedown Test Plan defines tests of the system in an operational environment to assess the readiness of people, procedures, and the system to assume field operational status.

(2) The Operational Changeover Plan defines the procedures, schedules, techniques, coordination, and training required to integrate a facility with a new system/subsystem.

(3) The OT&E Test Plan defines testing to be accomplished for assessing the operational suitability and operational effectiveness of the system.

(4) The Training Plan defines those training activities to be accomplished to ensure personnel are qualified before participation in site or system certification.

(5) The NAS Integration Test Plan defines testing to be accomplished for verifying compliance with NAS integration requirements. Integration requirements assess the operation of multiple interfaces and integration with other systems in as realistic an operational environment as possible.

(6) The DT&E Plan defines testing to be performed for design acceptance, technical risk assessment, and specification performance verification. DT&E plans are developed by the contractor in accordance with the contract.

(7) Site Shakedown Test Plans define the tests required to confirm the readiness of people, current procedures, and the system to resume field operational status.

(8) The ARTS IIA ISP Baseline Test Plan defines the tests to assess hardware and software performance in an operational environment.

(9) The Integrated Logistics Support Plan (ILSP) defines the elements of the NAILS Program applicable to the project. The ILSP also describes the project's maintenance concept.

(10) The MTP defines the test and evaluation program for the project and provides a framework for the systematic test and evaluation of the system to ensure that all functional and performance requirements are satisfied.

(11) The CIP provides a comprehensive plan for modernizing AT centers; and improving AT and AF facilities; and for maintaining capacity and capability of the NAS.

(12) Quality Control System Plan (QCSP). The contractor shall establish and maintain a QCSP in accordance with FAA-STD-016, Quality Control System Requirements.

(13) Computer Software Quality Control Program Plan (CSQCPP). The contractor shall establish and maintain a CSQCPP in accordance with FAA-STD-018, Computer Software Quality Program Requirements.

57. APPLICABLE DOCUMENTS. See appendix 2, List of Documents.

58.-59. RESERVED.



## CHAPTER 6. PROJECT FUNDING

60. PROJECT FUNDING STATUS, GENERAL. The ARTS IIA ISP enhancement project implemented by this order is funded according to the following profile:

**FUNDING PROFILE - ARTS IIA ISP**  
(in millions of dollars)

CIP NUMBER	PRIOR YEARS	FY 1992	FY 1993	FY 1994	FY 1995	TOTAL
# 46-30	23.4	15.3				38.7
# 32-06			9.5	26.1	9.4	45.0
SUBTOTAL	23.4	15.3	9.5	26.1	9.4	83.7
OTHER:	22.1	5.2				27.3
TOTAL	45.5	20.5	9.5	26.1	9.4	111.0

Note: # = Funds under ANA-400 control

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## CHAPTER 7. DEPLOYMENT

70. GENERAL DEPLOYMENT ASPECTS. A DRR will be conducted in accordance with Order 1800.63A to ensure all critical checklist items are resolved prior to deploying equipment to sites (see appendix 4). The regional offices will conduct site planning activities. A list of generic implementation activities for pre-shipment applicable to all sites is provided in table 7-1. Activities listed in the table provide guidance for deployment planning by sites. Each site will prepare site specific implementation schedules consistent with table 7-1 and their own requirements. Equipment installation and testing is the responsibility of the contractor. Upon contractor's arrival, FAA onsite personnel will demonstrate the condition of the operational system using onsite diagnostics, factory acceptance test (FAT) procedures, and the current software operational program, A2.XX. All discrepancies will be recorded in the contractors operation and maintenance log, and a copy given to the site TOR. FAA onsite personnel are responsible for correcting all discrepancies found during this testing.

71. SITE PREPARATION. The contractor will develop an installation planning report for ARTS IIA ISP, DS/DP, and EP/VC systems. This report will be delivered as per the contract schedule. The information contained in this report can be used by FAA regional and field organizations to prepare ARTS IIA ISP sites for delivery of ISP hardware/software for installation and checkout.

a. The FAA will be responsible for site preparation prior to equipment delivery. RADS will be installed by FAA personnel except for those associated with contractor installed ARTS IIA systems. All actions necessary to install and test the system shall be the responsibility of the contractor. The contractor shall provide an installation and cutover (INCO) team, generally consisting of two field engineering personnel. Adequate space will be provided onsite by the FAA for the secure storage of equipment and other deliverable items. This space should be located close to the area in which most of the equipment is to be installed.

b. The INCO team will arrive onsite in advance of scheduled equipment delivery to establish a site office, provide orientation, coordinate equipment arrival, and conduct a site survey. As the situation warrants, additional contractor personnel may make short-term visits to the site to provide technical support to the INCO team and provide training for FAA site personnel. These visits will be coordinated with the FAA TOR.

TABLE 7-1.  
SOFTWARE IMPLEMENTATION ACTIVITIES (PRE-SHIPMENT)

<u>ACTIVITY</u>	<u>SCHEDULE</u>	<u>RESPONSIBILITY</u>
Attend Seminars	Completed	Sites
Complete Site Adaption Kit	Ongoing	Sites
Forward Kits to Contractor	Ongoing	AOS-410
Submit Changes to Site Adaptation Kit	Ongoing	Sites
Front End Plots and Site Adaptation Data Bases to Sites	60 days prior S/W delivery	to Contractor
Site Adaptation Data Bases Baseline	30 days prior S/W delivery	Contractor
EEM Issued	30 days prior to S/W delivery	AOS-300
SPB-4 Issued (Documentation)	Upon delivery to Key-site	AOS-410
SPB-5 Issued (Software)	Reference appendix 1	AOS-410

TABLE 7-1 (Continued)  
SYSTEM IMPLEMENTATION ACTIVITIES

<u>ACTIVITY</u>	<u>SCHEDULE</u>	<u>RESPONSIBILITY</u>
Prepare Installation Planning Report	August 1991	Contractor
Approve Installation Planning Report	October 1991	ANA-400
Prepare Installation Instructions	At Site Survey	Site TOR
Conduct Site Survey	See appendix 1	Contractor
Review & Approve Site Survey	See appendix 1	TOR
Install Equipment	See appendix 1	Contractor

c. A site survey report shall be prepared and will include site conditions. The report serves to notify the FAA of potential problems discovered during the visit that may require corrective action by the FAA prior to equipment installation.

d. The major reason for this report will be to alert the FAA of any physical or technical risks anticipated with the ISP installation. Recommended solutions to these problems will be included in the report. Additionally, information from the site surveys will be used to develop the ISP installation plan. Concurrent with the site survey, an effort will be initiated to prepare the site installation planning report which will be submitted to the FAA within 90 days of contract award. The report will outline specific planning requirements common to all sites and identify variations for sites which differ from the conditions of typical installations. The report will include, but not be limited to, the following:

(1) Location of equipment in the control area and the equipment room. Floor plan layouts of both rooms will be provided by the Government.

(2) Equipment delivery route requirements.

(3) Area requirements for equipment units, including operations and maintenance functions.

(4) Location, size, and type of power panel to accommodate all equipment power requirements.

(5) Physical sizes and recommended layout of ISP equipment components.

(6) Maximum distances between equipment units based on cable length limitations.

(7) Cable support requirements such as cable trays, ladders, ducts, conduits, and other raceways for all proposed equipment.

(8) Location of primary power cables or wiring for branch circuits from distribution panels to all proposed equipment.

(9) Manufacturer and catalog numbers of connectors required to connect the proposed equipment to the signal and power cable.

(10) Power consumption data required for each equipment cabinet.

(11) Floor loading of individual cabinets.

(12) Signal grounding power and individual cabinet grounding requirements.

(13) Schedule of events during installation and checkout.

(14) Any other technical or general information that will help ensure a smooth and orderly integration of the ISP hardware.

72. DELIVERY. The contractor will ship all ISP equipment to each site in a single shipment. ISP equipment will be prepared and shipped via air ride padded van or in accordance with Electronics and Electrical Equipment, Assessories, and Provision, Items (Repair Parts: Packaging of) MIL-E-17555 Method 3. The selected mode of delivery and packaging will be determined on a site-by-site basis after evaluation of available information. The contractor will deliver and install equipment in accordance with the delivery and installation sequence as approved by the APME, ANA-140. Each site will be notified in advance of the time of delivery, by their respective region.

a. Hardware. The contractor will deliver ISP components and emplace these units as indicated in the site installation plan. The contractor will retain all responsibility for equipment until it is placed in its final location. Placement of equipment will be supervised by the contractor and accomplished by their shipping agents. The contractor is contractually responsible for packing and shipping hardware to the sites. Contractor personnel shall receive, inspect, unpack, and inventory equipment as it is received onsite.

b. Software. The contractor is responsible for packing and shipping software (including site adaptation), computer tapes (including operational, and other computer support tapes), manuals and other documentation to AOS-410 at the FAA Technical Center. Maintenance diagnostic tapes and technical instruction manuals shall be delivered to AOS-300. Subsequent delivery of operational software to individual sites is the responsibility of ATR-410, and delivery of maintenance software is the responsibility of AOS-300.

c. Engineering Services. The contractor shall be available to provide hardware and software engineering services throughout

the life of the contract. This includes providing changes to the ARTS IIA software (operational, diagnostic, off-line, and utility), firmware, and documentation to correct discrepancies observed during installation. The APME, ANA-140, is the single focal point for obtaining contractor engineering services to correct discrepancies observed during installation. All requests for contractor engineering services shall be made either through AOS-410 (operational software) or AOS-300 (maintenance software, hardware, and firmware) to the project TO, who will arrange for the required contractor support.

73. INSTALLATION PLAN. The site planning function is the responsibility of the regions and AF/AT personnel at the sites. Guidance and direction for installation planning will be provided by the RIG using information provided in this PIP and other guidance documentation. The TOR at each site is responsible for ensuring that the installation activities following shipment are completed (typical activities are presented in table 7-2).

a. The contractor will develop an installation planning report for all ISP configurations, i.e., basic and all selected options. This report will be delivered per the contract schedule so that information contained in this report can be used by the FAA field organizations to prepare sites for delivery of ISP hardware as well as for installation and checkout.

b. The installation planning report furnished to the FAA will be the basis for site generated plans to be developed for each site and adapted as required for site peculiar constraints. The contractor will review these individual site installation plans at least 60 days prior to system delivery. When approved by FAA, the site planning document will be used by the onsite FAA engineer-in-charge and contractor installation personnel as the final installation plan. Upon completion of installation, an annotated copy the of site installation plan will remain at the site for record purposes.

TABLE 7-2.  
SOFTWARE UPGRADE ACTIVITIES (FOLLOWING SHIPMENT)

<u>ACTIVITY</u>	<u>SCHEDULE</u>	<u>RESPONSIBILITY</u>
Install ISP Hardware (If required)	Upon delivery to site	Contractor
Run Diagnostics	Day 1	Contractor
"Patched" ARTS II A2.XX Software Acceptance	Day 1	AT
Accept System	After 72 hour test	AF
Install/Test Software (A2.XX)	Day 1 thru 30	AT

NOTE: Installation and testing of A2.XX software will be conducted on a not-to-interfere basis with operations.

74. FIRST SITE VERSUS FOLLOW ON SITE REQUIREMENTS.

a. The first operational ARTS IIA ISP site will be considered the key site. More than one operational ARTS IIA ISP site may be designated by the APME, ANA-140 as a key site. Additional support required for key site activities will be provided jointly by the FAA Technical Center, FAA headquarters, AAP SETA and the contractor. Discrepancies noted during execution of plans and procedures will be corrected and follow-on sites will be promptly notified of the actions to be taken. The purpose of key sites is to validate the following prior to their use at subsequent sites:

- (1) Contractor onsite system test plan and procedures.
- (2) Contractor installation plan.
- (3) System shakedown test plan and procedures.
- (4) Operational demonstration test plan and procedures.
- (5) Operational changeover plan and procedures.

b. FAA Headquarters/AAP SETA. FAA headquarters and AAP SETA personnel will assist sites in the following activities:

- (1) Validation of contractor installation plan.
- (2) Validation of contractor onsite test plan/procedures and test data sheets.
- (3) Validation of system shakedown test plan/procedures.
- (4) Validation of operations changeover plan/procedures.

c. Contractor.

(1) The contractor will be required to make any required changes to the ARTS IIA software (operational, diagnostic, off-line, utility). This shall include the development, integration, checkout, and documentation required due to test and evaluation.



(2) All ARTS IIA software delivered to the first site shall be maintained in accordance with established CM procedures (Order 1800.8F). Any and all changes to the baseline ARTS IIA must be coordinated and controlled in accordance with these CM procedures.

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## CHAPTER 8. VERIFICATION

80. FACTORY VERIFICATION.

a. The verification of the technical contract requirements of the ARTS IIA ISP will be accomplished by a series of test and evaluation activities, formal and informal at the contractor's development/production facilities, FAA Technical Center, and FAA operational sites. The verification approach will comply with Order 6020.2A, Joint Acceptance Inspection.

b. Factory verification testing is the responsibility of the contractor, and will be witnessed by FAA personnel. It is composed of test and evaluation activities performed at the contractor's facility. These are as follows:

- (1) Incoming inspection.
- (2) Subsystem functional test.
- (3) Factory system functional test.
- (4) Design qualification test.
  - (a) Reliability test.
  - (b) Maintainability test.
- (5) Service conditions test.
- (6) Type test.

Plans to conduct the FAT's are developed by the contractor and approved by the Government.

c. Incoming inspections are conducted by the contractor. These inspections are informal and verify that all materials, component parts and subsystems conform to applicable standards.

d. Subsystem functional testing is conducted by the contractor on all production line subsystems. It is the final phase of production line testing and verifies production line quality. Functional requirements and interfaces of the DDAS, DPS, display subsystems and their subassemblies are verified. This verification is accomplished through the use of hardware simulators and internal diagnostic software which verify that each unit is capable of operating in conformance with its functional requirements when integrated into a system.

e. Factory system functional tests are conducted by the contractor on the first production system produced under each contract buy; i.e., first system produced under the first buy, or basic, and first system produced after any option to buy additional articles is exercised. Those systems are tested at the contractor's facility, utilize simulated inputs, and run on operational software programs which are contractually required for the system under test. Factory system test demonstrates whether or not specification requirements are met satisfactorily.

f. Design qualification tests are performed by the contractor on the first purchased subsystem of any contract phase. Design qualification testing consists of reliability, maintainability, service conditions, and functional tests.

(1) Reliability testing verifies system conformance with specified reliability requirements using a standard ARTS IIA ISP system configured with four RADS. Reliability verification includes contractor performance of a confidence/stability test which is run until the specification requirement is met.

(2) Maintainability requirements for newly designed ARTS IIA ISP hardware are verified by analysis of mean-time-to-repair data derived from time-to-repair fault measurement.

(3) Service conditions tests will be performed which verify that ARTS IIA ISP systems will operate satisfactorily throughout the range of service conditions specified. Parameters of these controlled environmental conditions will be varied to discrete points within the range on condition limits. The contractor will conduct this test using two systems. Each system will be configured with an APC, RADS, code select box, beacon remote control box, display control panel, aural alarm control box, SMC, remote speaker, keyboard, and Position Entry Module (PEM). Where appropriate contract options have been exercised, the APC will be a dual and/or APC with an EP, and/or RADS equipped with VC capability. Specific systems supplied with all interconnecting cables with maximum length will be selected at random for the tests.

(4) Functional tests will be performed by the contractor to verify that functional characteristics of the ARTS IIA ISP conform with specification requirements. These include measuring system response time, system capacity, and determining system overload caused by functional degradation. Tests will be conducted by performing government approved

baseline test procedures and hardware diagnostics for all new and existing modules and subsystems.

g. Type tests are conducted by the contractor. Type tests are the same as service condition tests except, these tests verify that all production subsystems meet the specification requirements. These environmental tests are performed on a mid-production run subsystem. Subsystem environment type tests shall be conducted in accordance with by the contract schedule.

81. CHECKOUT. This is the first stage of onsite testing and is performed by the contractor.

a. ARTS IIA ISP. These tests are used to verify hardware system integrity of the contractor delivered equipment prior to interfacing with any site equipment. The tests will consist of processing internally generated targets, and checking the alignment of the displays for the correct presentations. The tests will include voltage and signal verification at all external output points, and check for ground or short conditions at all external input points to ensure that interfaces with external equipment are correct.

b. ISP Upgrade Kit. Upgrade kit checkout will be accomplished by first running diagnostics on the current ARTS IIA ISP at the site to ensure it is operational prior to new equipment installation. The new hardware will be installed and the ARTS IIA diagnostics will be run to verify the proper installation and operations of the DPS and associated peripherals. The test will consist of voltage, signal and ground verification at selected external output points, and running the complete repertoire of the ARTS IIA ISP diagnostic programs. The ARTS IIA ISP diagnostics are partitioned into a set of instructions which are designed to check a specific function or hardware unit or module. The successful completion of each diagnostic program will be verified by the completion message being output to the TTY.

82. CONTRACTOR INTEGRATION TESTING. During this phase the contractor will install first article subsystems and conduct verification testing at the FAA Technical Center. Success is indicated by FAA acceptance of the system tested at the FAA Technical Center. The contractor will initiate FAA Technical Center test and evaluation activity by performing preliminary testing of each system configuration and ensuring proper operation of ARTS IIA ISP hardware, software, and firmware prior to connection with FAA Technical Center equipment. After this initial checkout, acceptance testing can begin. Acceptance testing consists of the contractor conducting a functional test

of the system using approved baseline test procedures. The test uses both live and simulated inputs to exercise the subsystems and includes testing A2.XX software and firmware and a qualification test of the ARTS II A2.XX operational software.

(1) The ARTS IIA ISP acceptance test demonstrates subsystem hardware and software compliance with contract technical requirements, as specified in the ARTS IIA ISP functional specification. During various portions of the acceptance test, ARTS IIA functions are validated by connecting ARTS IIA equipment to FAA Technical Center radars. Successful completion of the ARTS IIA ISP acceptance test is required prior to FAA integration and shakedown testing. ARTS IIA ISP function and performance parameters validated during acceptance testing consist of:

- (a) Scheduler and executive control.
- (b) SMC processing and message output.
- (c) Mass storage unit processing.
- (d) Support tools.
- (e) Display processing.
- (f) Keyboard input processing.
- (g) Flight plan input processing.
- (h) Tracking function/CA.
- (i) Minimum Safe Altitude Warning (MSAW).
- (j) MCI.
- (k) Beacon input processing.
- (l) Interfacility message processing.
- (m) Site adaptation parameters.
- (n) Confidence/stability.
- (o) DE.

(2) The patched ARTS IIA A2.XX qualification test demonstrates that the patched ARTS IIA software operates correctly on ARTS IIA ISP hardware. Acceptance criteria for this test were derived from the FAA document, Automated Radar Terminal

System (ARTS) II Baseline Test Plan. Successful completion of the patched ARTS II A2.XX qualification test is the prerequisite for delivery of the software patch to the ARTS IIA ISP sites.

83. CONTRACTOR ACCEPTANCE INSPECTION (CAI). Upon successful completion of contractor integration testing, FAA Technical Center CAI will be conducted by the PM. Establishment of this CAI milestone signifies that the hardware, firmware, Universal Data Set (UDS) site-adapted software, and patched ARTS IIA ISP software have met all defined contractual functional requirements. CAI constitutes formal acceptance by APME, ANA-140. Successful completion of FAA Technical Center contractor integration testing also signifies the beginning of NAS integration and shakedown testing.

a. The acceptance test will consist of loading the operational A2.XX program into the FAA Technical Center ARTS IIA system. Executing software exercises to verify selected adaptation parameter operations demonstrates that the proper adaptation parameter values are stored and that functions perform as expected. There will also be an inspection of adaptation documentation (plots, computer printouts) after the build and an acceptance test of operational software by APME.

b. After CAI, the tapes and documentation will be validated for use by AOS-410, packaged, and sent to the key site for shakedown testing.

84. FAA TECHNICAL CENTER INTEGRATION TESTING. Integration testing at the FAA Technical Center by the Engineering, Test, and Evaluation Service, Automation Division (ACN-100A) is a one-time test performed prior to delivery to the first operational site. The FAA Technical Center integration test verifies that the equipment performs in accordance with requirements of the specification and contract. This test is accomplished using live and simulated data. Simulated data is provided using beacon target simulators. The integration test consists of checking system interfaces, running diagnostics, and running selected system onsite test (SOST) procedures to verify that requirements have been met.

85. SHAKEDOWN.

a. System shakedown testing occurs at the FAA Technical Center and each site. Shakedown testing at the FAA Technical Center is for the purpose of ensuring, that the system/subsystem requirements of the NAS are verified prior to delivery to operational sites. This OT&E shakedown of the ARTS IIA ISP verifies that the system operational effectiveness and

operational suitability are ready for full deployment as part of the NAS.

b. Site shakedown testing is conducted to verify that the system/equipment installed by the contractor meets contract specifications for installation and operation of hardware and software and, where applicable, for integration with other systems.

c. AOS-400 and AOS-410 are responsible for developing a shakedown test plan and procedures for FAA Technical Center shakedown testing. They are also responsible for developing and verifying generic site shakedown test plans and procedures for the field.

(1) Shakedown. Shakedown will be accomplished at the FAA Technical Center prior to hardware/software delivery to the first ARTS IIA ISP site. Shakedown testing will verify the software is capable of providing necessary control functions and FAA Technical Center readiness to support ARTS IIA operation. AOS-410 shakedown tests verify the operational suitability and effectiveness of the software using controllers in a simulated (i.e., not controlling air traffic) environment. These tests are accomplished using live and simulated data. AOS-400 shakedown tests verify the operational readiness of the system and the maintainability of the equipment.

(a) Shakedown Process. The "patched" ARTS IIA A2.XX operational software release will be loaded and exercised. All operational displays, keyboards, and PEM's will be exercised to verify correct operation. The ARTS IIA operational software UDS tape will be loaded into the system, and software exercises, which consist of demonstrating selected parameters and/or operations, will be run to check general site adaptation accuracy.

(b) Shakedown Tests. These tests are designed to demonstrate that the proper value is stored or functions perform as expected and that they are interpreted and used correctly by the operational program. At the completion of FAA Technical Center Shakedown, the ANA-400 PM will present a report to the EXCOM DRR board, recommending deployment to the first operational site (key-site).

(c) Shakedown Activities. Shakedown test activities will be accomplished in a simulated environment, to evaluate the following:



1. Operational and maintenance proficiency: Site training, personnel readiness, training adequacy.

2. Equipment performance: determination of reliability and maintainability, verification of system performance, failure mode analysis, failure detection and recovery, adequacy of all subsystems.

3. Provisioning: Ensuring the availability of field logistic support.

4. Confirmation of technical data and instruction book page changes.

5. Software functions: Validation of site adaptation data, flight plan input, system parameters, CA, MSAW, and aural alarm.

6. Operational suitability of display data: Data blocks, tab lists, registration, CA, MSAW, TTG, TSG, BT, and aural alarm.

7. Adequacy and suitability of procedures and operations.

8. Verification of operations changeover procedures.

86. JOINT ACCEPTANCE INSPECTION (JAI). The JAI activities shall be conducted in accordance with Order 6030.45, Facility Reference Data File. Accordingly, a JAI board shall be established to ensure that each ARTS IIA facility meets specified requirements for operation and maintenance, and has demonstrated that the facility is ready to be commissioned. The JAI board, when convened, may include the following representatives:

- a. The ANA-140 TO or TO representative.
- b. AF sector manager (or designated person).
- c. Regional AT division representative.
- d. AT facility manager (or designated person) from the involved facility.
- e. Aviation Standards National Field Office, flight inspection field offices or the regional Flight Standards division representatives as appropriate.

the system during low traffic density periods, then phased into full time use in accordance with the site shakedown procedures.

89. OPERATIONAL READINESS DEMONSTRATION. The ORD is conducted in order to determine and establish the date on which a facility is to be placed into operational use. To accomplish the ORD the facility must satisfy installation, performance, operation, and maintenance criteria. The ORD is the culmination of site shakedown activities. It formally documents the facility's personnel, procedures, hardware, software, technical support, and equipment are ready to support real time ATC tasks.

## CHAPTER 9. INTEGRATED LOGISTICS SUPPORT

90. MAINTENANCE CONCEPT.

a. Hardware. ASM-400 is responsible for developing updated ARTS IIA maintenance requirements and maintaining the ARTS IIA diagnostic and maintenance program. The ARTS IIA hardware design incorporates on-line diagnostics built-in test equipments (BITE) to aid in fault maintenance, i.e., onsite and at the depot. There are two types of onsite maintenance. They are periodic preventive maintenance and corrective maintenance. The ARTS IIA design allows minimization of the frequency and duration of periodic preventive maintenance tasks which occur at predetermined intervals. Onsite corrective maintenance consists of fault isolation, removal and replacement of unserviceable line replaceable units (LRU), and certification that the malfunctioning system/subsystem is again operable. Faulty non-expendable LRU's are shipped to the FAA Logistics Center for repair, via the Exchange and Repair (E&R) process, and returned to the supply system. Site authorities will dispose of expendable LRU's. Depot level repair is managed by the FAA Logistics Center. ARTS IIA equipment is repaired at the depot by FAA technicians. Equipment which cannot be repaired in-house is sent out for vendor repair. The maintenance concept is outlined in the ARTS IIA ILSP Appendix G.

b. Software. AOS-410 and AOS-300 will support the maintenance and operational software programs. AOS-410 is responsible for the delivery of operational software to the sites. The software technical reporting is accomplished via program trouble reports (PTR) completed by the sites and forwarded to AOS-410 for operational software/non-operational software support. AOS-300 is responsible for maintenance software support.

91. TRAINING. The Office of Training and Higher Education, AHT-1, in coordination with the operating services, provides overall training guidance and monitors training program accomplishment. An ARTS IIA ISP Training Plan will be developed to address all training requirements for effective course development. A schedule will also be established to ensure that all training will be completed on time. The program office, ANA-400, in coordination with ATZ and ASM will ensure that controllers and maintenance personnel are trained in the operation and maintenance of the ARTS IIA ISP system prior to the site installation date. Personnel receiving this training will be FAA maintenance technicians who have completed the ARTS IIA and ARTS display equipment training; journeyman and

sub-journeyman air traffic controllers at an ARTS IIA facility. After initial training, all ARTS IIA ISP training courses will be integrated into the FAA Academy training curricula.

92. SUPPORT TOOLS AND TEST EQUIPMENT. All support tools and test equipment necessary for the installation, test, and maintenance of the ARTS IIA ISP system will be identified by the contractor. A tools list, meeting the documentation requirements of FAA-G-1210E paragraph S-14-1 and a test equipment list meeting FAA-G-1210E paragraph S-13-1, will be provided to APME, ANA-140 for review and approval. Test equipment must be selected and documented in accordance with Order 6200.4D, Test Equipment Management Handbook. Support tools and test equipment lists will be approved during the provisioning technical conference. The list of support tools and test equipment will be used by both Government agencies and vendors, under guidance of the CO, to procure the appropriate tools and test equipment required for each site.

93. SUPPLY SUPPORT.

a. Initial Support. The provisioning levels for spare parts and assemblies were determined through contractor-developed provisioning technical documentation and requirements analyses. This data was utilized to set appropriate sparing levels for the various items and to establish provisioning buy levels. Initial sparing levels, predetermined by the project office, will be filled for both site and the FAA Logistics Center by the contractor prior to operational activation of the hardware at the various sites. These initial sparing levels will be determined from data developed and recommendations provided by the contractor under guidance provided within FAA-G-1375b, Spare Parts Peculiar for Electronic, Electrical and Mechanical Equipment. These initial spares will be fully contractor/vendor tested, site accepted, and positioned at each site.

b. Follow-On Support. At least 3 months prior to the scheduled JAI, regions are responsible for requisitioning Initial Supply Support Allowance Chart (ISSAC) items via FAA-4650-12, Material Requisition/Issue/Receipt, from the FAA Logistics Center. This ensures that the ISSAC items are received onsite prior to JAI. Routine requisitioning of follow-on support items from the FAA Logistics Center will be accomplished through the established agency procedures.

c. The FAA Logistics Center Support. The FAA Form 4650-12, for each facility will identify the number, and type of equipment to be supported. The forms are forwarded to the FAA Logistics Center no later than 3 months prior to the scheduled date of

final acceptance of the ARTS IIA ISP at the site. The FAA Logistics Center uses the procedures identified in Order 4250.9A, paragraph 33 to furnish stock items. The ISSAC's are to be received onsite before the scheduled date of the JAI. The requisitioning of follow-on site spares will be accomplished through normal requisition procedures with the FAA Logistics Center. Storage space for spares will be provided at each site. The regions should ensure this space is made available.

94. VENDOR DATA AND TECHNICAL MANUALS. The effort for ISP consists of updating and reformatting existing ARTS IIA hardware instruction books, updating existing software manuals and specifications, and providing Commercial off-the-shelf (COTS) manuals for new disk drives, tape streamer unit, and SMC.

a. The following ARTS IIA hardware instruction books will be updated and reformatted:

(1) TI 6190.11, Automated Radar Terminal System (ARTS) Instruction Book.

(2) TI 6190.12, Acquisition and Processing Set (APS) Instruction Book.

(3) TI 6190.16A, Computer Equipment Instruction Book (Volumes I and II).

(4) TI 6190.13, RADS Maintenance Instruction Manual.

b. The following ARTS IIA software manuals and specifications will be updated to incorporate the ISP changes:

(1) TM-PA-0006/007, User's and Operator's Manual for ARTS IIA Enhancements.

(2) TM-PA-0006/008, Computer Program Functional Specification (CPFS) for ARTS IIA Enhancements (Part 1 and Part 2).

(3) TM-PA-0006/006, Coding Specification for ARTS IIA Enhancements (Volumes 1 through 5).

(4) TI 6190.22, ARTS IIA Diagnostic and Maintenance Program Reference Manual.

(5) TM-PA-(L)-0078/000, User's and Operator's Manual for ARTS IIA Site Adaptation Software Tools.

(6) TM-PA-(L)-0054/000, Computer Program Functional Specification (CPFS) Part 1 for ARTS IIA Site Adaptation Tools.

(7) TM-PA-(L)-0055/000, Computer Program Functional Specification (CPFS) Part 2 for ARTS IIA Site Adaptation Tools.

(8) TM-PA-(L)-0119/000, Coding Specification for ARTS IIA Site Adaptation Software Tools.

c. The following new software documents will be prepared as part of the ISP:

(1) Utility Program Reference Manual.

(2) Maintenance Program Reference Manual.

(3) Programmer's Reference Manual.

(4) Site Adaptable Parameters Reference Manuals for Field Use (consists of excerpts from CPFS-1, CPFS-2, User/Operator Manual, and Coding Specification).

d. COTS manuals will be provided to support the operation and maintenance of disk drives, tape streamer unit, and the SMC. These manuals will be supplemented, as needed, to support the maintenance concept and meet the intent of FAA-D-2494b.

95. EQUIPMENT REMOVAL. Disposition of equipment removed by the contractor during installation of the ARTS IIA ISP shall be in accordance with Order 4800.2A, Utilization and Disposal of Excess and Surplus Personal Property.

96. FACILITIES. ASM-200 is responsible for ensuring that the current ARTS IIA Staffing Standard is adjusted to include the ISP onsite maintenance staffing requirements. The regions are responsible for documenting individual site staffing requirements in the Facility Master File. AMC-1 is responsible for defining additional depot level maintenance staffing requirements. The regions are responsible for reporting new requirements for ARTS IIA ISP maintenance support facilities to the program office. AMC-1 has identified a requirement for relocation of the ARTS IIA test bed. AOS-300 and AOS-400 are responsible for identifying additional software support facility requirements to the program office.

97. PACKAGING, HANDLING, STORAGE AND TRANSPORTATION. All equipment, components, and spares shipped to the sites will be packaged and marked in accordance with the supplemental requirements of ASTM-D-3951. Regions are responsible for

identifying and addressing new and additional site spares storage requirements. AMC-1 is responsible for identifying and addressing new or additional spares storage requirements for the FAA Logistics Center.

98. CONFIGURATION MANAGEMENT. The CM procedures for the ARTS IIA ISP software will follow the established FAA procedures identified in Order 1800.8F, NAS Configuration Management; and NAS-MD-001, NAS Subsystem Baseline Configuration and Documentation Listing. The following further defines the CM process.

a. Hardware Configuration Management (HCM). Hardware and firmware product baselines have been established and AOS-300 has assumed CM responsibility for the hardware and firmware. Hardware and firmware problem reporting is accomplished via hardware discrepancy reports (HDR) and Program Trouble Report (PTR) respectively, prepared by the sites and submitted to AOS-300 in accordance with Order 1100.134A, Maintenance of National Airspace System Automation Subsystems.

b. Software Configuration Management (SCM). Software refers to the operational, non-operational support, and diagnostic computer programs delivered the same time the product baseline is established, i.e., the system acceptance at the FAA Technical Center. ANA-140 APME will assume CM responsibility when the product baseline is established. The Automation Software Policy and Planning Division (ATR-200) will assume CM responsibilities for operational and support software upon delivery to the last site.

(1) Software Maintenance. Two branches at the FAA Technical Center (AOS-410 and AOS-300) will support software program maintenance. Terminal Field Support Branch, AOS-410, will be responsible for the operational software (including site adaptation software and associated documentation) and non-operational support software. AOS-300 will be responsible for maintenance of firmware, SMC functional software, diagnostic and analysis software, and associated documentation upon system delivery to the first site. Contractor support for hardware, firmware, and software maintenance shall be available until completion of system delivery at the last site.

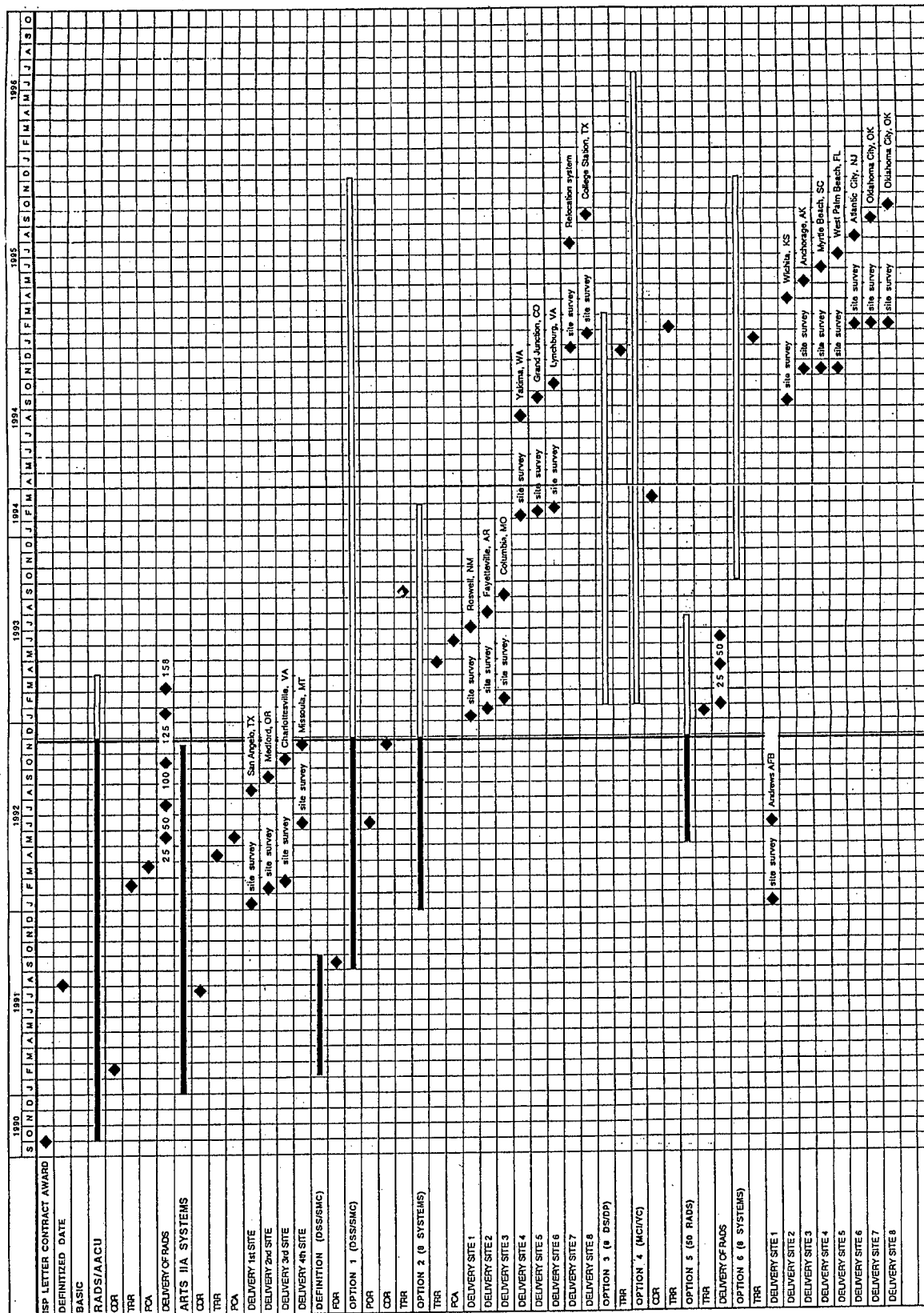
(2) Software technical reporting is accomplished via PTR. PTR's completed by the ARTS IIA sites are forwarded to AOS-410 for operational software/non-operational support software; and to AOS-300 for diagnostic software, in compliance with paragraph 12 of Order 1100.134A. New system tapes resulting from PTR's, will be provided to the sites.

c. Reviews and Audits. Configuration reviews and audits are conducted to verify that the level of performance achieved for each subsystem at that point in the life-cycle is as specified. Reviews are the mechanisms by which the different levels of specification documentation are examined and approved before proceeding with the next step in the development process. Configuration audits must verify documentation against previous baselines and added changes as well as compare the configuration against the approved configuration identification document.



## Appendix 1

## APPENDIX 1. MAJOR MILESTONE ACTIVITIES





**APPENDIX 2. LIST OF DOCUMENTS**

**FAA Plans**

Not Assigned

FAA Capital Investment  
Plan

**FAA Specifications**

FAA-E-2570.c

Automated Radar Terminal  
System type IIA Interim  
Support Plan

**FAA Orders**

1100.134A

Maintenance of National  
Airspace Automation  
Subsystems

1800.8F

National Airspace System  
Configuration Management

1800.63A

National Airspace System  
Deployment Readiness  
Review Program

4250.9A

Field Inventory  
Management and  
Replenishment Handbook

4650.7

Management of Project  
Material

4800.2A

Utilization and Disposal  
of Excess and Surplus  
Personal Property

6030.45

Facility Reference Data  
File

6200.4D

Test Equipment Management  
Handbook

1810.4B

FAA NAS Test and  
Evaluation Policy

4650.7B

Stock Screen and Review  
of Disposal

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6190.13  
Appendix 2

4620.3C

Initial Support for New  
or Modified Equipment  
Installation

1750.6A

National Airspace System  
Documentation Facility

**FAA Technical Instructions**

TI 6190.11

Automated Radar Terminal  
System Instruction Book

TI 6190.12

Acquisition and  
Processing Set (APS)  
Instruction Book

TI 6190.16A

Computer Equipment  
Instruction Book (Volumes  
I and II)

TI 6190.13

RADS Maintenance  
Instruction Manual

TI 6190.22

ARTS IIA Diagnostic and  
Maintenance Program  
Reference Manual

FAA-D-2494b

Technical Instruction  
Book Manuscript;  
Electronic, Electrical,  
Mechanical Equipment,  
Requirements  
for Preparation of  
Manuscripts and  
Production of Books

**FAA Standards**

FAA-STD-024a

Preparation of Test and  
Evaluation Plans and Test  
Procedures

FAA-STD-016

Quality Control System  
Requirements

FAA-STD-018

Computer Software Quality  
Program Requirements

FAA-STD-036

Preparation of Project  
Implementation Plans

NAS Documents

NAS-MD-001

National Airspace System  
Subsystem Baseline  
Configuration and  
Documentation Listing

FAA Control Documents

TM-PA-0006/006

Coding Specification for  
ARTS IIA Enhancements  
(Volume 1 through 5)

TM-PA-0006/008

Computer Program  
Functional Specification  
(CPFS) for ARTS IIA  
Enhancements (Part 1 and  
Part 2)

TM-PA-0006/007

User's and Operator's  
Manual for ARTS IIA  
Enhancements

TM-PA-(L)-0078/000

User's and Operator's  
Manual for ARTS IIA Site  
Adaptation Software Tools

TM-PA-(L)-0054/000

Computer Program  
Functional Specification  
Part 1 for ARTS IIA Site  
Adaptation Tools

TM-PA-(L)-0055/000

Computer Program  
Functional Specification  
Part 2 for ARTS IIA Site  
Adaptation Tools

TM-PA-(L)-0119/000

Coding Specification for  
ARTS IIA Site Adaptation  
Software Tools

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6190.13  
Appendix 2

**Military Standards**

MIL-E-17555

Electronic and Electrical  
Equipment, Accessories,  
and Provisioned Items  
(Repair Parts: Packaging  
of)

APPENDIX 3. ARTS IIA TELEPHONE LIST

TITLE	NAME	CODE	TELEPHONE
Program Manager	Robert Voss	ANA-400	202-267-8349
Deputy Program Manager	Art Salomon	ANA-401	
Business Manager	Jack Walters	ANA-402	202-267-8362
Secretary	Donna Massowd	ANA-400	202-267-3633
	For All ANA ORG	FAX	202-267-8365
Associate Program Manager for Engineering	Vacant	ANA-140	202-267-8364
Technical Officer	Curtis McCloskey	ANA-140	202-267-8684
Associate Program Manager for Logistics	Mark Hoover	ANS-420	202-267-5838
Associate Program Manager for Testing	Jay Brown	ACN-110	609-484-5521
Associate Program Manager for Contracts	Richard Baker	ASU-350D	202-267-7396
Associate Program Manager for Quality	Joey Salazar	ASU-421E	813-854-7627
Associate Program Manager for Requirements	Jim Norris	ATR-125	202-267-9175
Associate Program Manager for Planning	Larry Paschich	ATP-125	202-267-9341
Associate Program Manager for Sys. Engineering	Jim Lenz	ASE-120	202-646-5979
Associate Program Manager for General Counsel	Gregory Carter	AGC-520	202-267-3480
Project Specialist	Denise Holbert	ANA-100A	202-267-8352
Contract Specialist	Larry Greer	ASU-350D	202-267-7414
Project Specialist	Steve Frith	ACN-110	609-484-5521
Project Specialist	Marcus Brown	ATR-200	202-267-9440
Project Specialist	Pat Gude	ATM-120	202-267-7040
Contractor	Don Gray	AAP SETA	703-734-6781
Contractor	Chuck Perow	AAP SETA	202-488-9740
Contractor	Ray Graff	AAP SETA	202-864-9240
Contractor	Dave Dougherty	PARAMAX	215-648-2482
Regional Project Manager	Robert Knosalla	AAL-421C	FTS 868-5312
Regional Project Manager	Doug Edwards	ACE-425E	FTS 867-5676
Regional Project Manager	Mark Migletta	AEA-451.1	FTS 667-1198
Regional Project Manager	Jack Albrecht	AGL-421.2	FTS 387-7760
Regional Project Manager	Bruce Ng	ANE-422N	FTS 836-7271
Regional Project Manager	Cal Collins	ANM-455.K	FTS 392-2390
Regional Project Manager	Glenn Beaupre	ASO-422.4	FTS 246-7371
Regional Project Manager	Bill Kolp	ASW-421	FTS 734-5474
Regional Project Manager	John Shea	AWP-422.42	FTS 984-1720



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**APPENDIX 4. DRR MILESTONES**

<u>ACTIVITIES</u>	<u>DATE</u>
1. Initiate DRR Process	TBS (1/30/93)
2. DRR Team Meeting	TBS (1/30/93)
3. Initiate DRR Checklist Reviews	TBS (1/30/93)
4. Delivery of equipment to OT&E Site	TBS (1/30/93)
5. Successful Completion of OT&E/Shakedown Testing	TBS (1/30/93)
6. DRR EXCOM (Deployment Decision)	TBS (1/30/93)

